

# UK Patent Application

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G11B 31/00, H04H 7/00

(52) UK CL (Edition K)  
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(56) Documents cited  
GB 2170943 A GB 1088145 A EP 0164253 A1  
WO 86/02224 A1

(58) Field of search  
UK CL (Edition K) G5R RB72 RB73 RGB RGC RHX  
INT CL<sup>o</sup> G11B, H04H

## (54) Fully automated radio disc jockey system

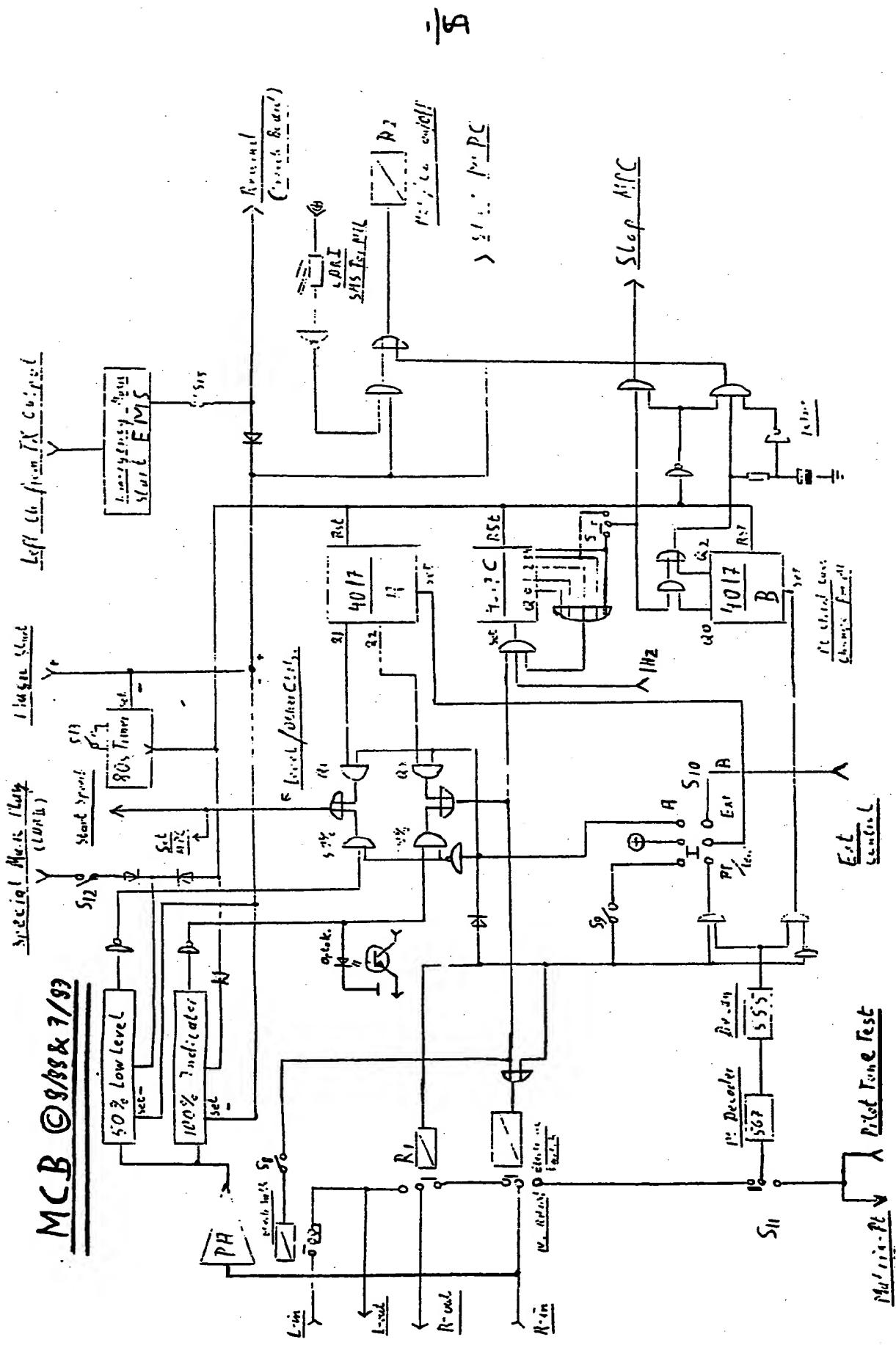
(57) This system compiles different Radio or Television programme inputs. When the entertainment source begins to fade out, an information tape starts and is mixed over the entertainment input. When the information input is about to finish, the entertainment source starts and is mixed under the information. After the actual end of the information input its tape drive will be stopped. When the entertainment input ends again, the process as described above will be repeated. The order of various information inputs such as announcements, commercials or news on several tapes can be preprogrammed. The entertainment source which can be any kind of signal source, eg. record, tape, compact disc, in a running sequence of several songs is stopped after each song. Special provisions (such as a music play back counter) can be applied. The entertainment source can be controlled by volume level indicators, pilot tones or external commands. The whole system is protected against operational errors.

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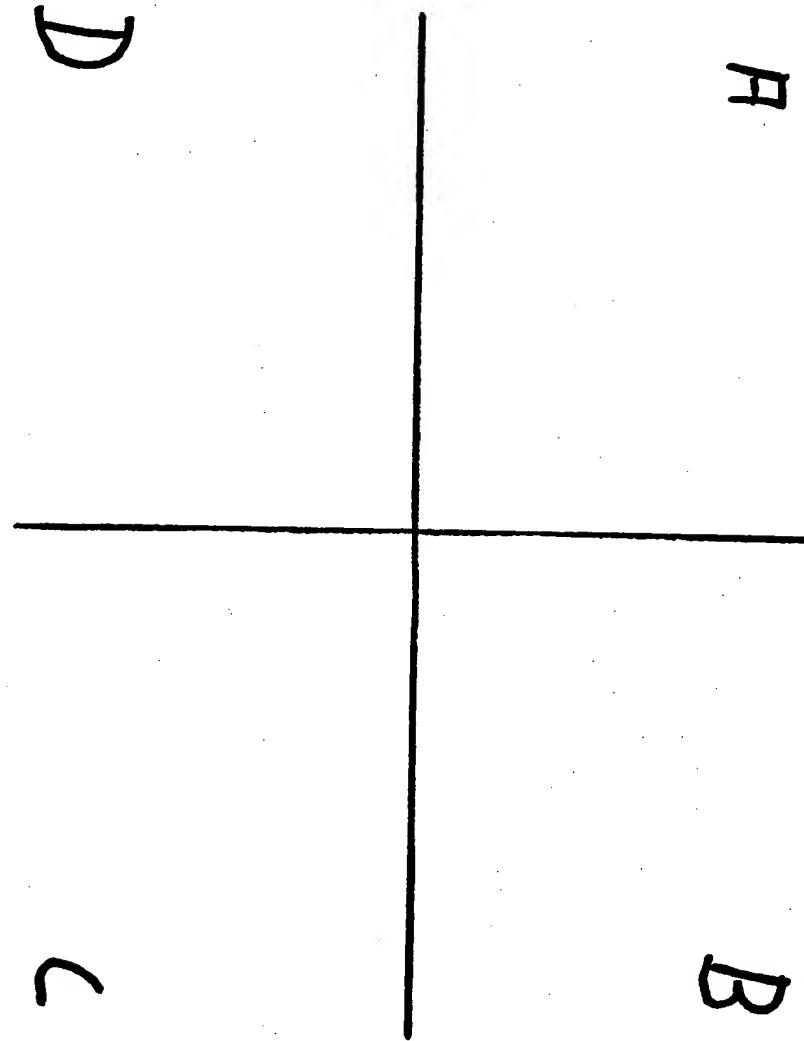
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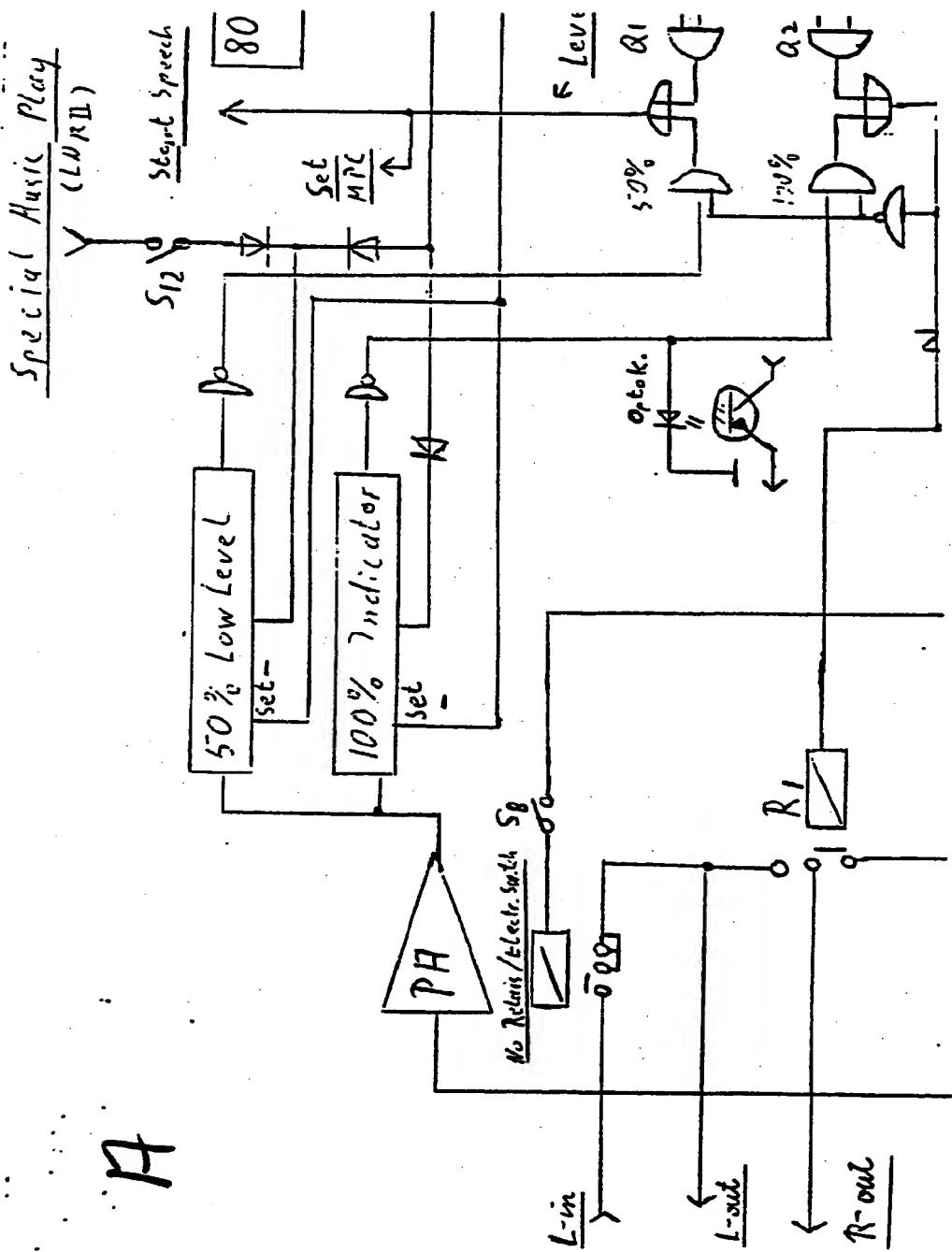


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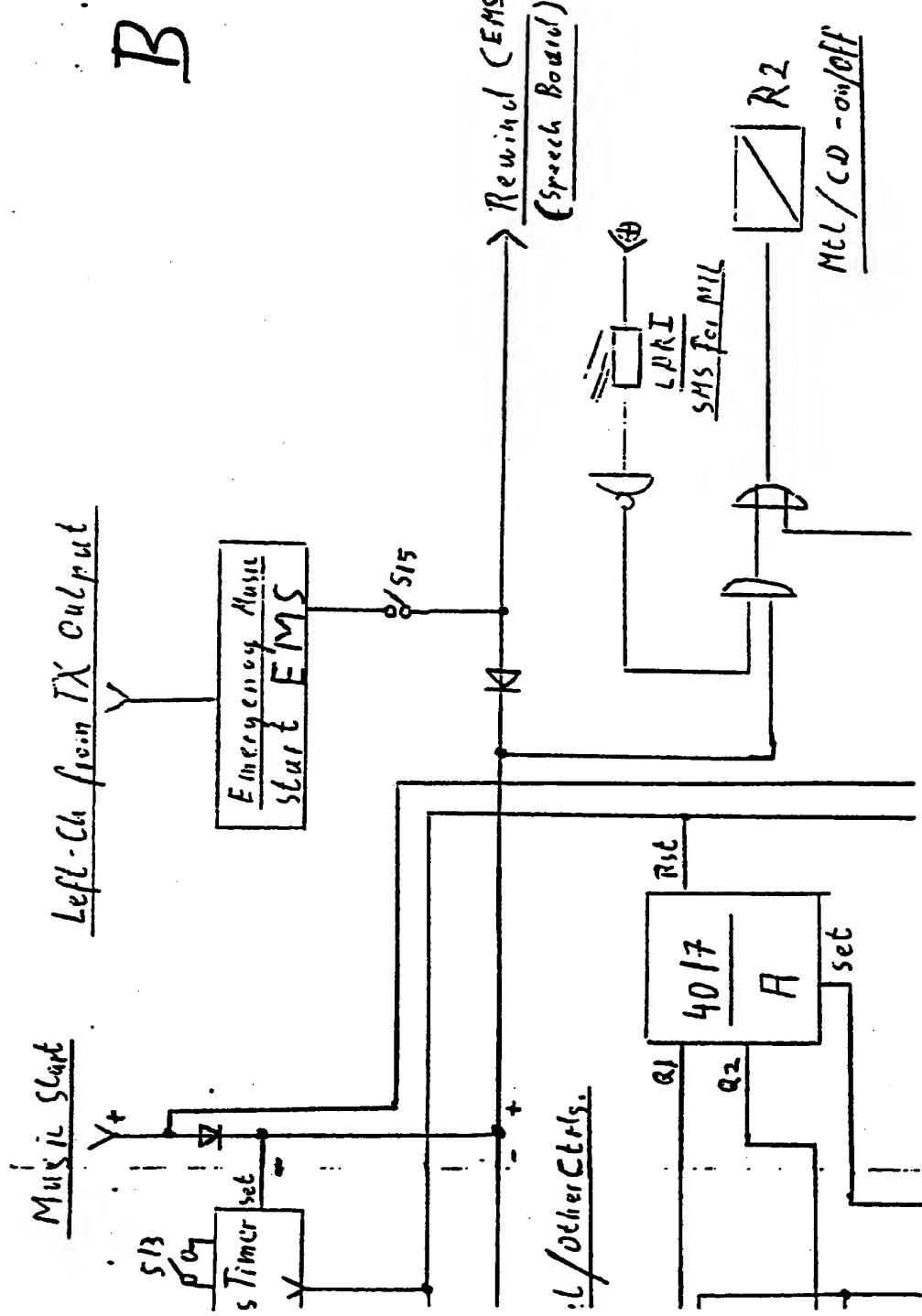
Music Control Board (Block)



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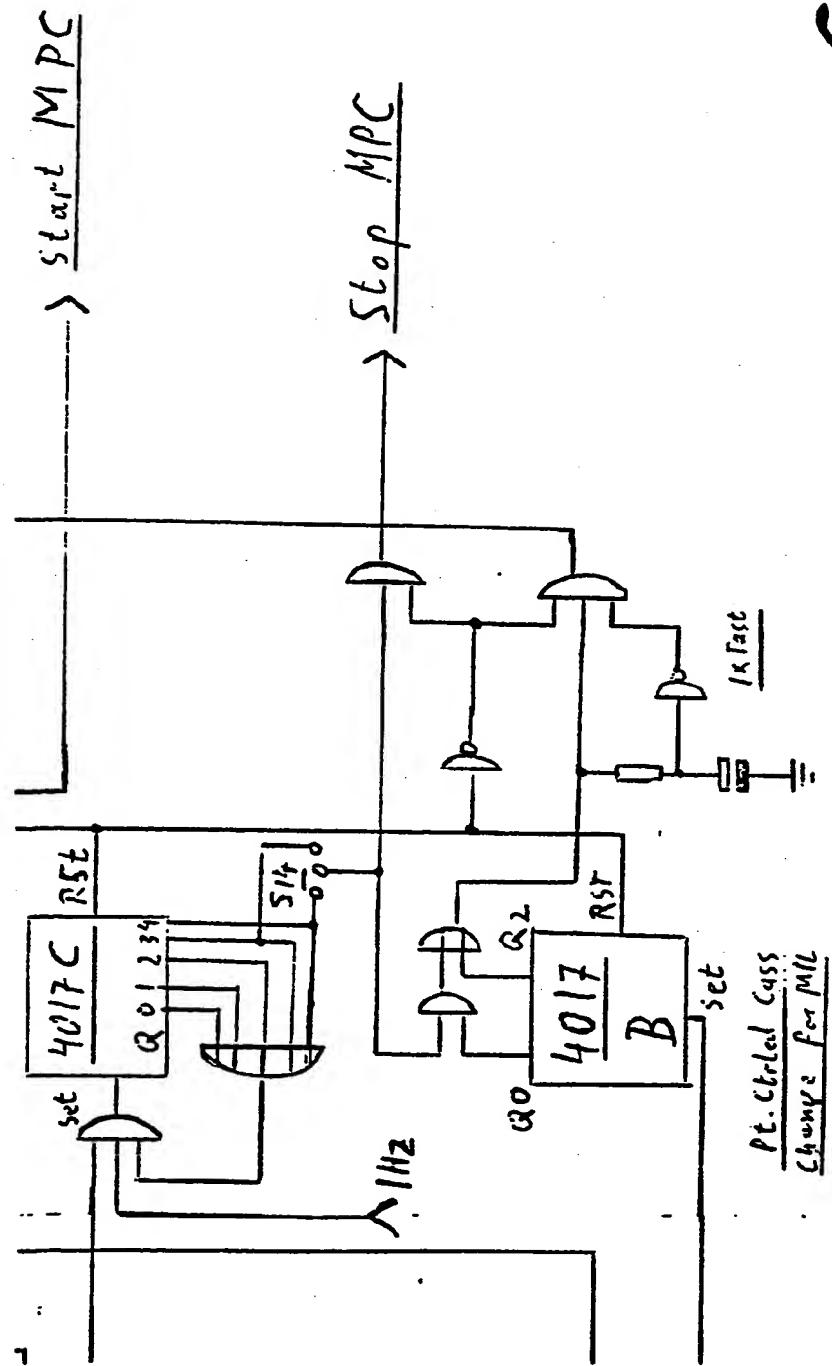


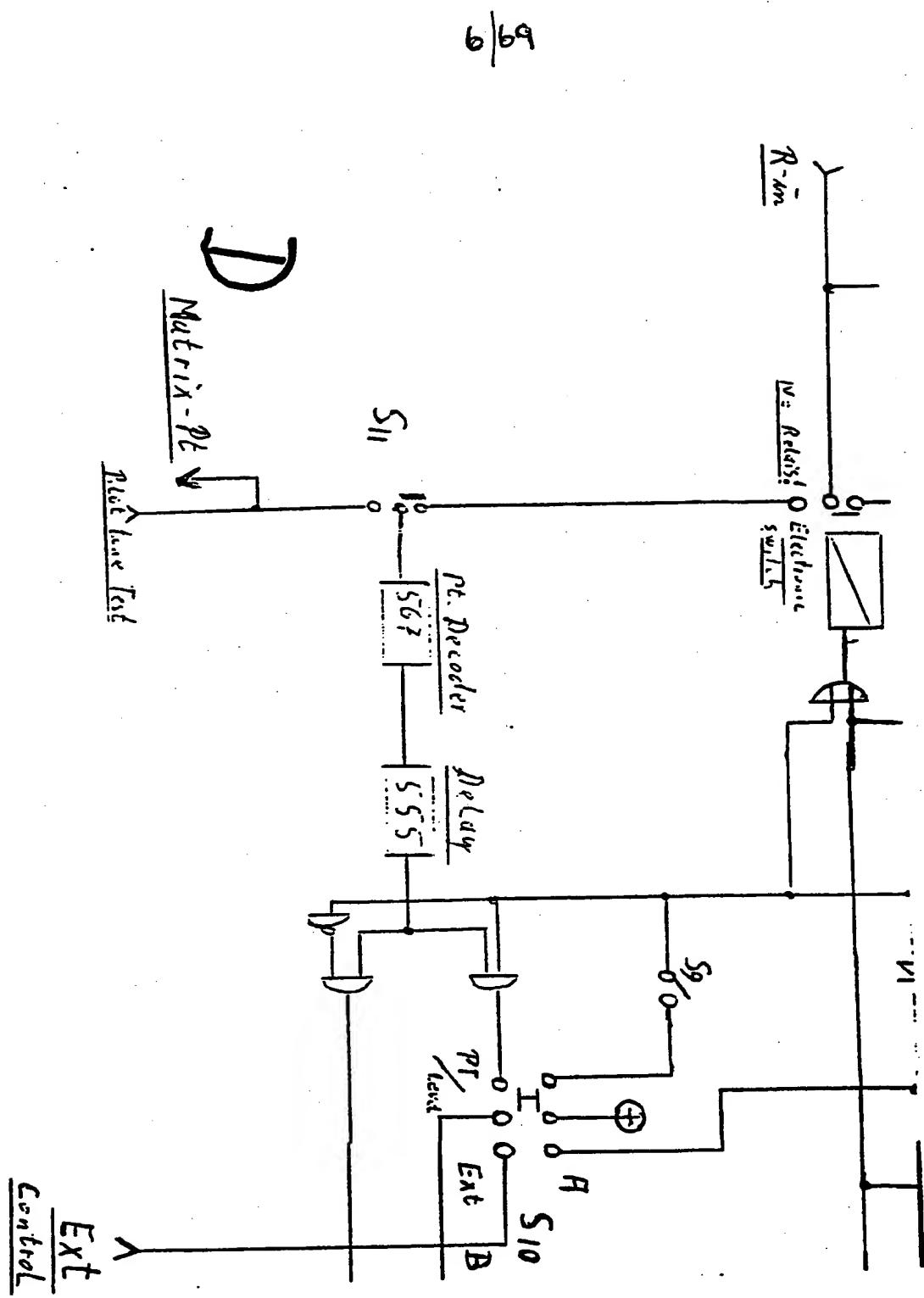
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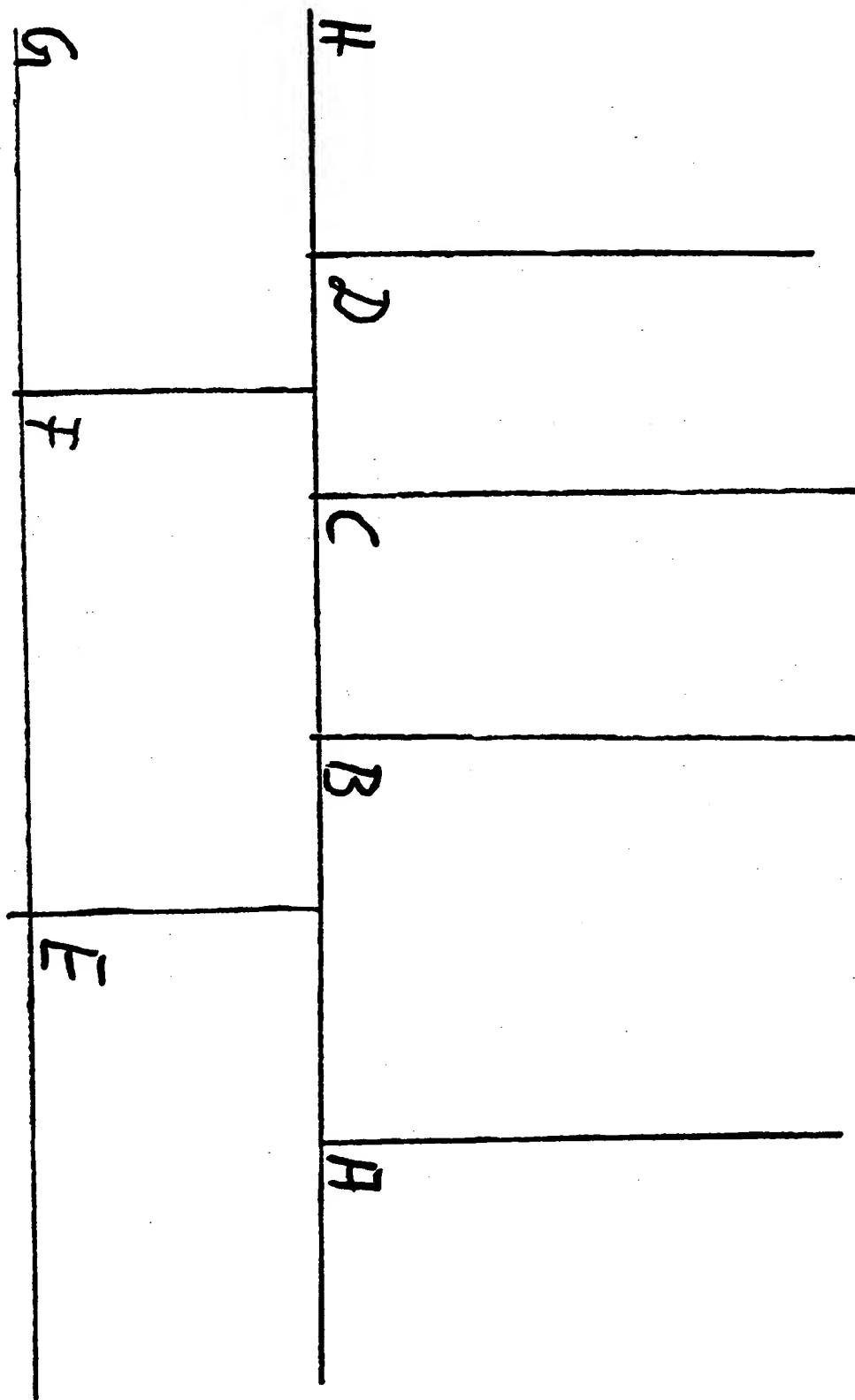
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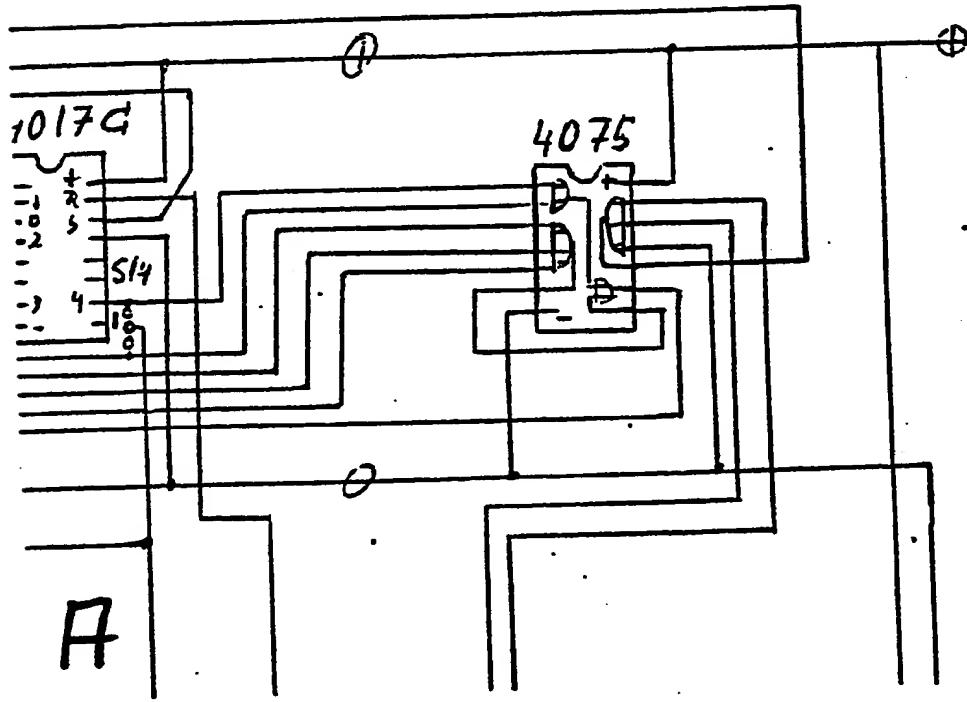
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## Music Control Board



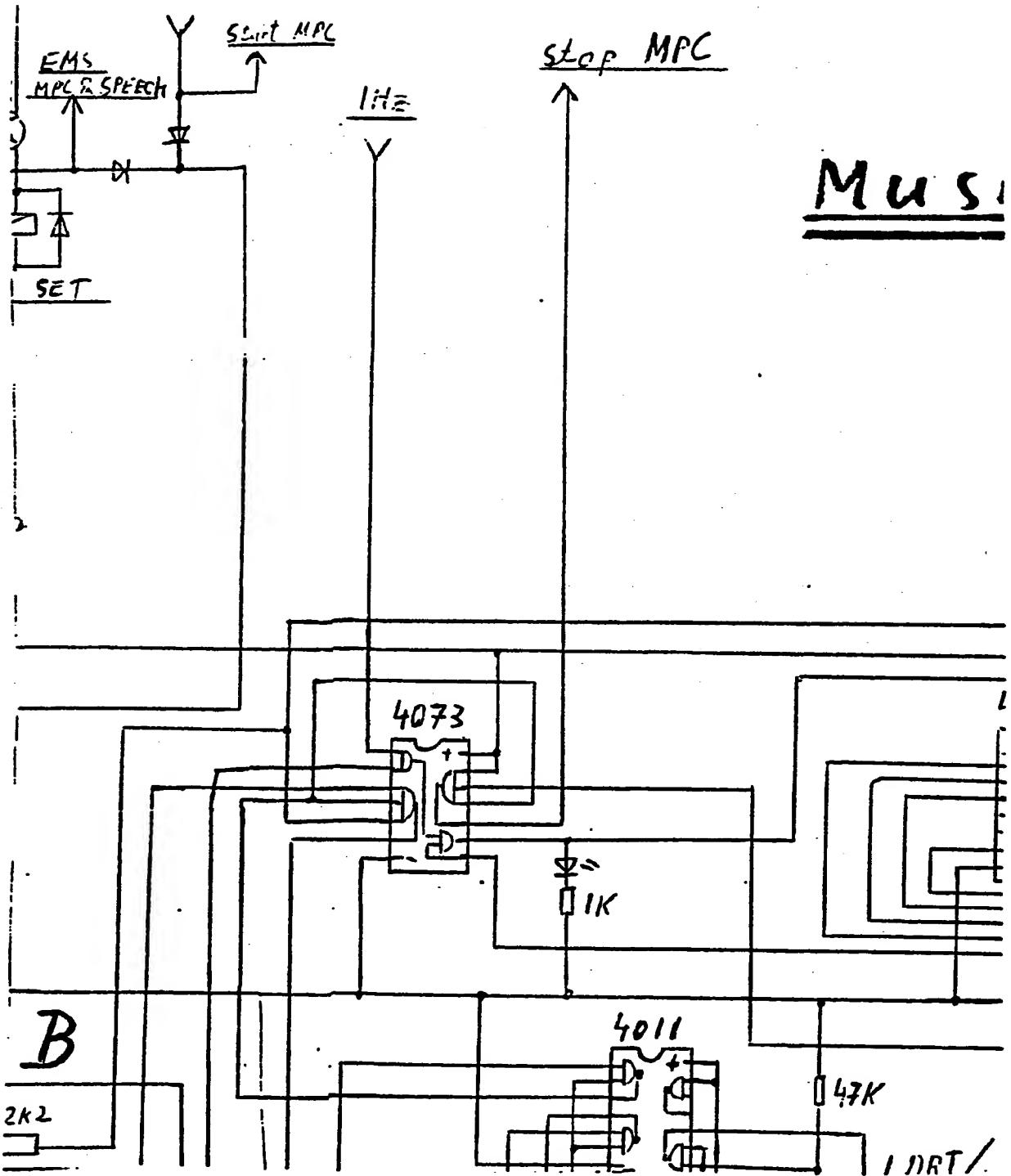
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# ic Control Board



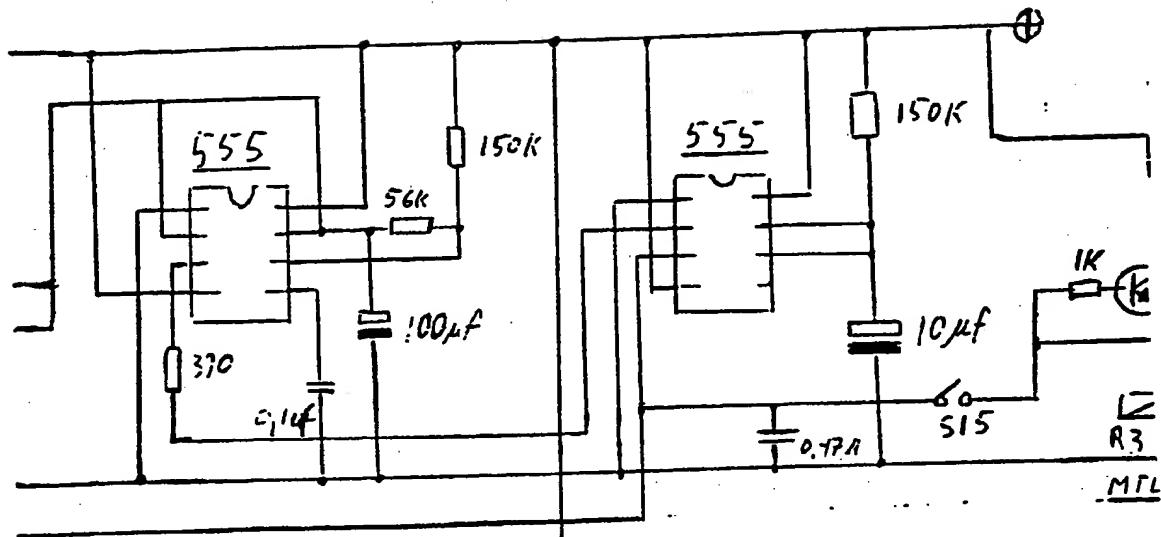
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Music Start

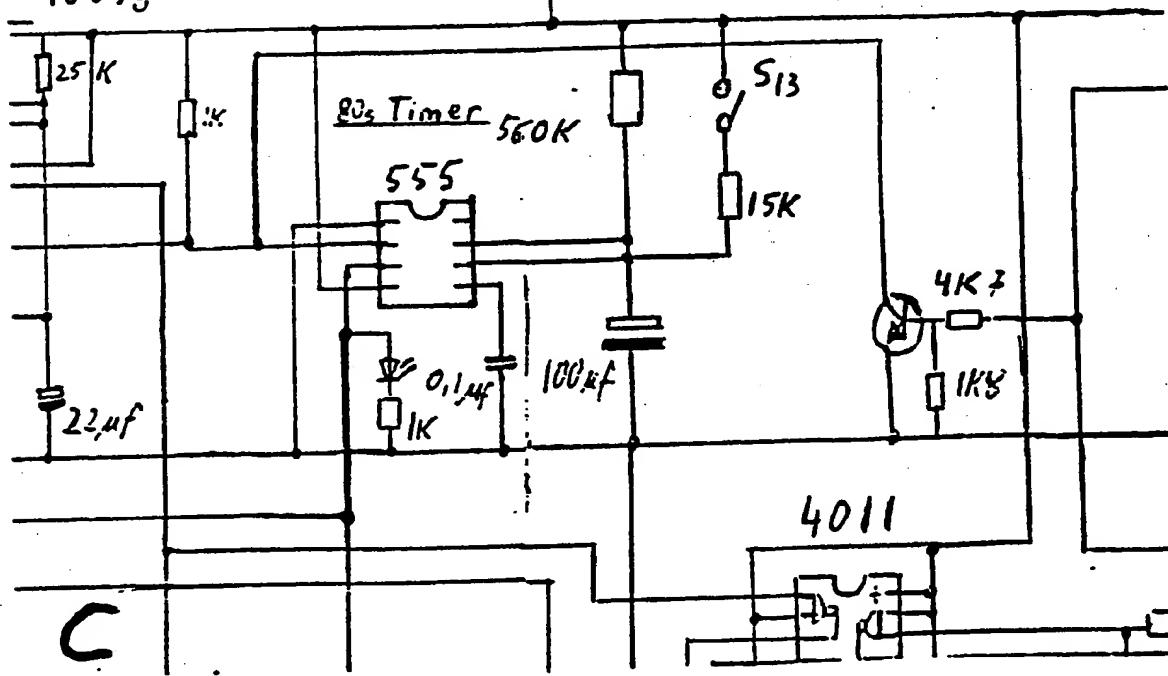


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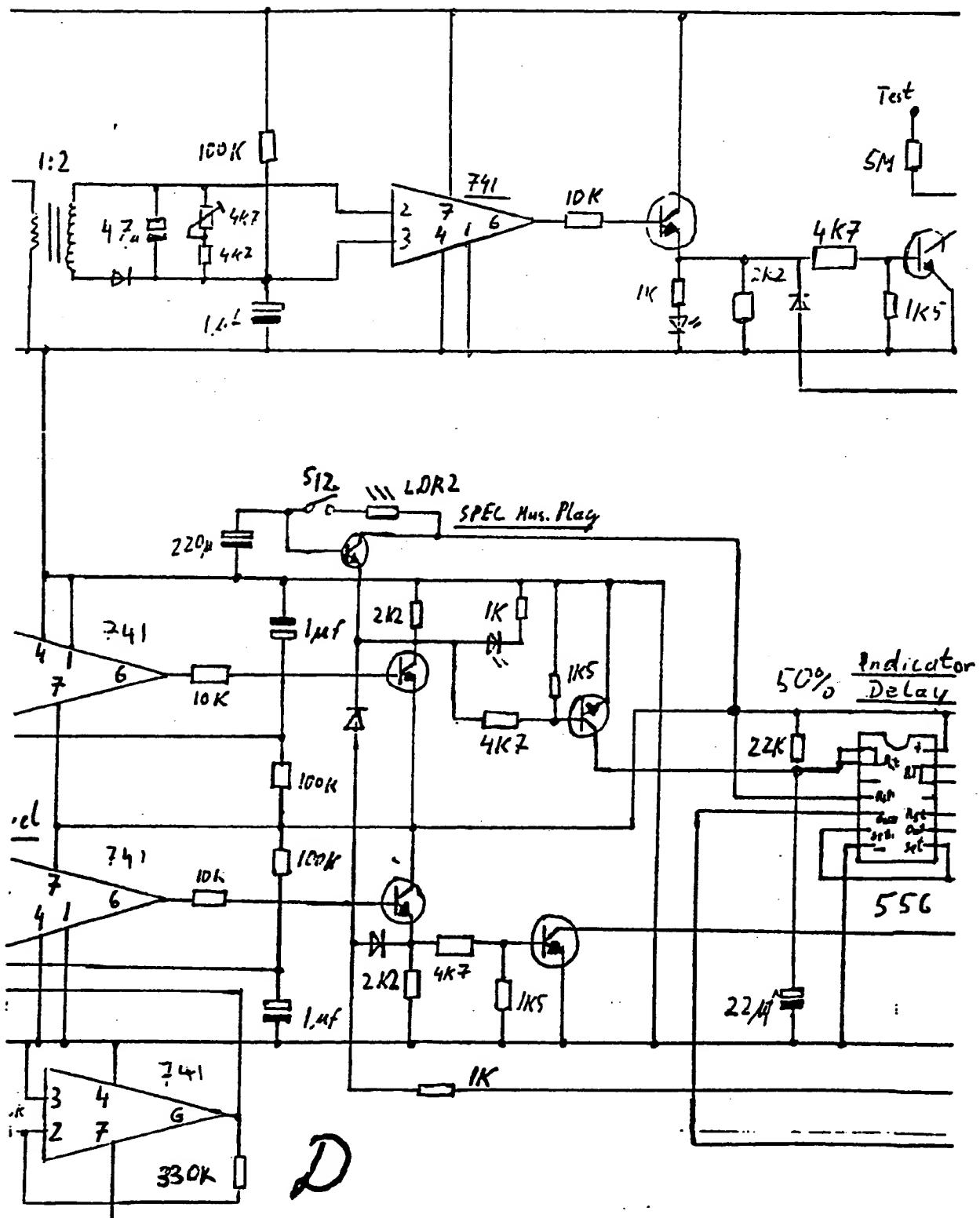
CY Music Start



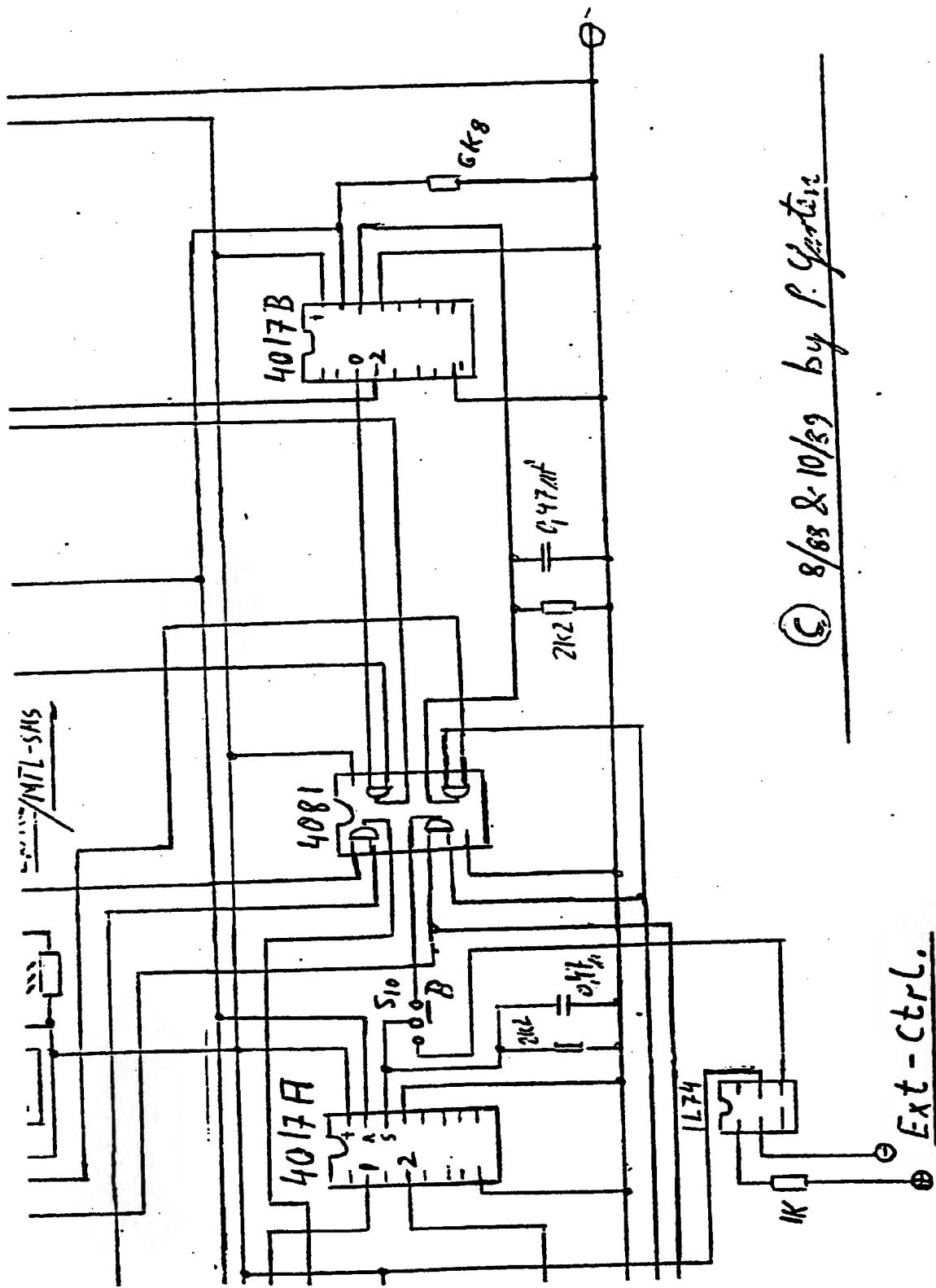
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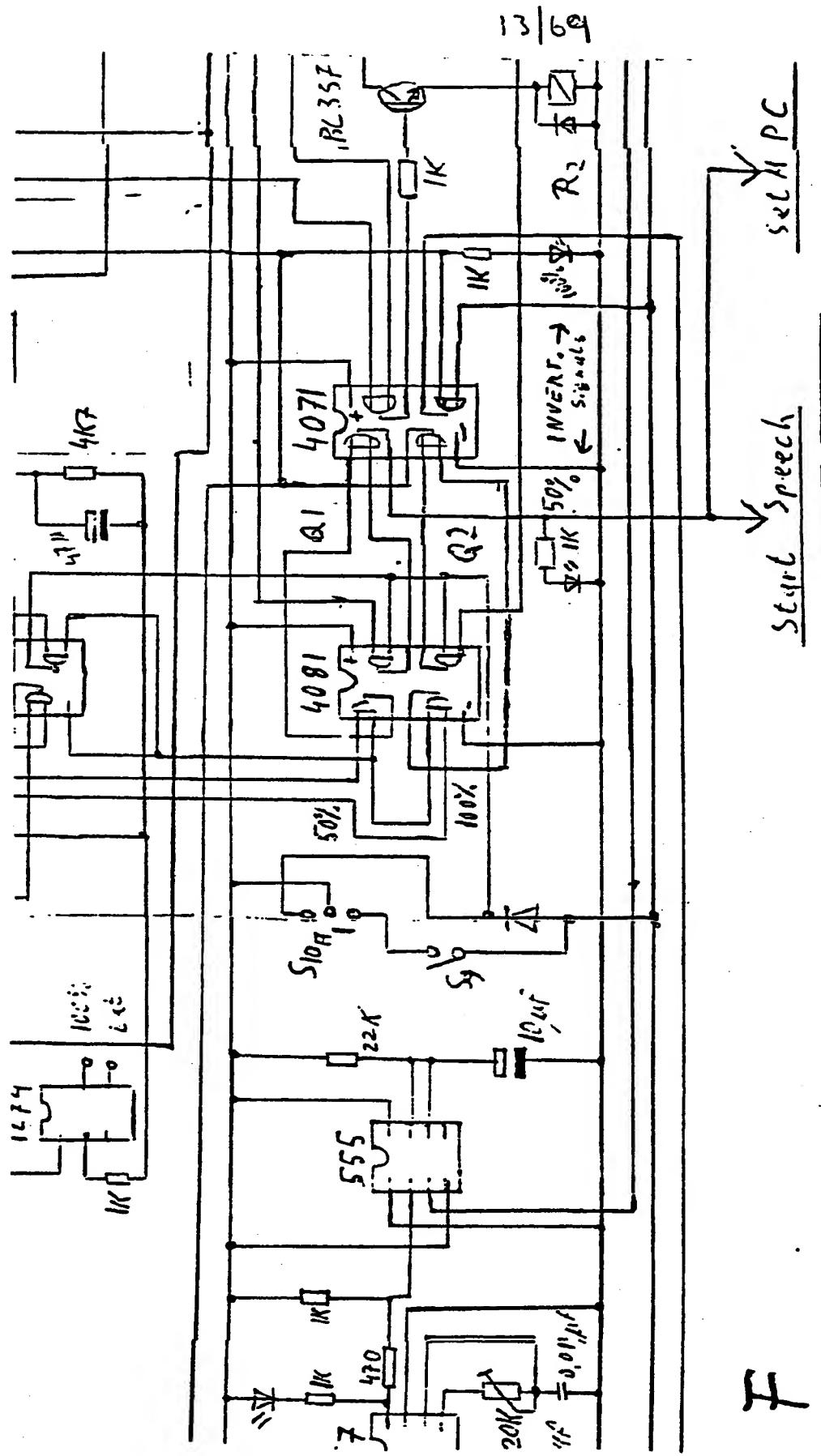
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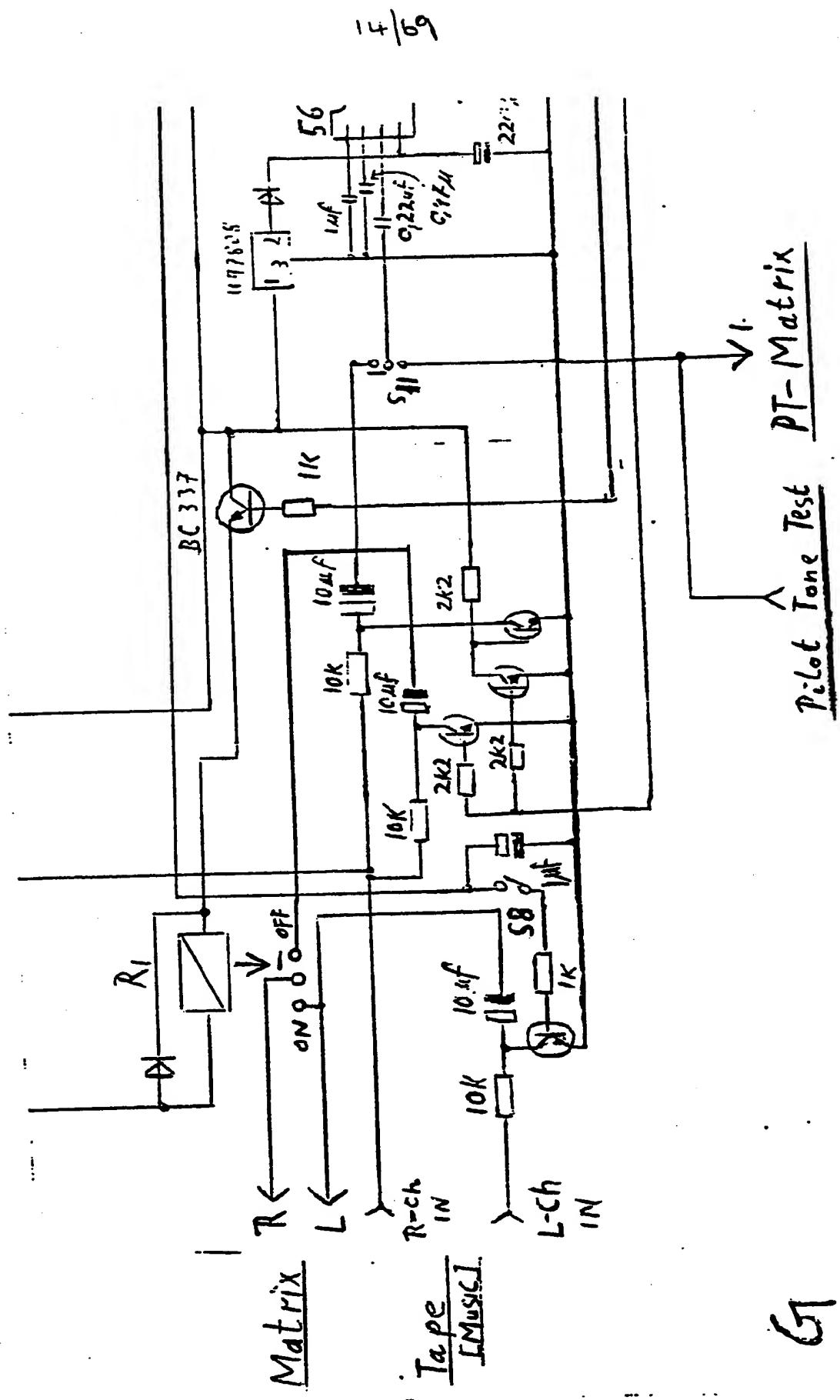
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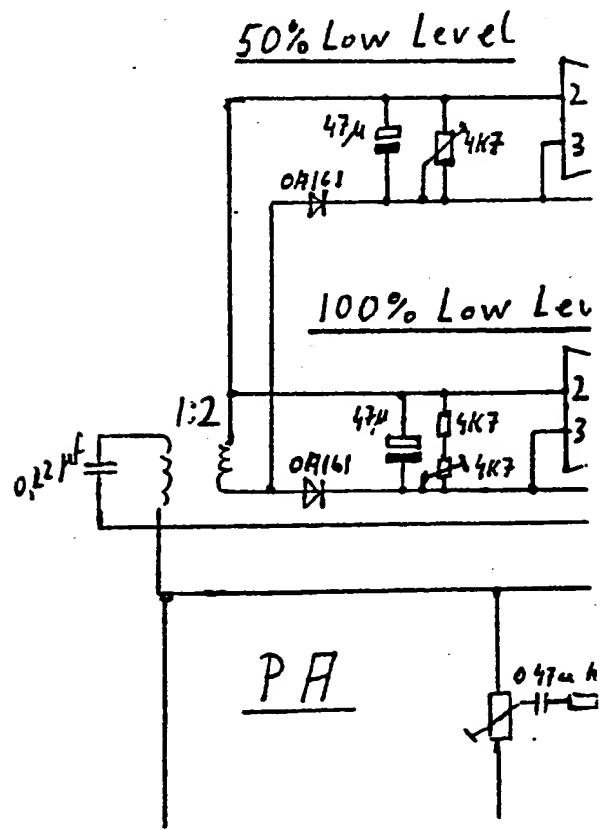
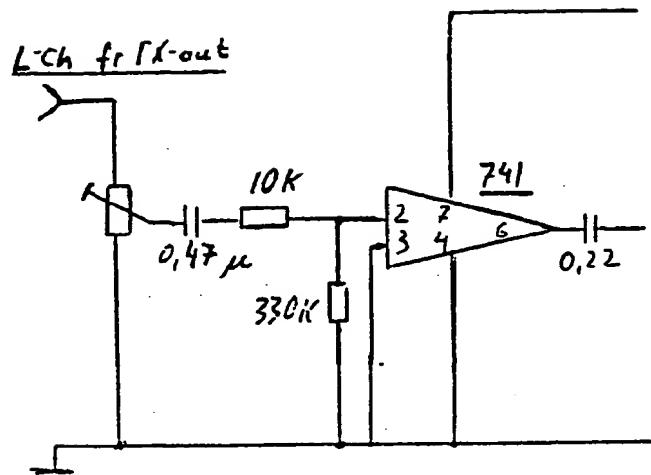
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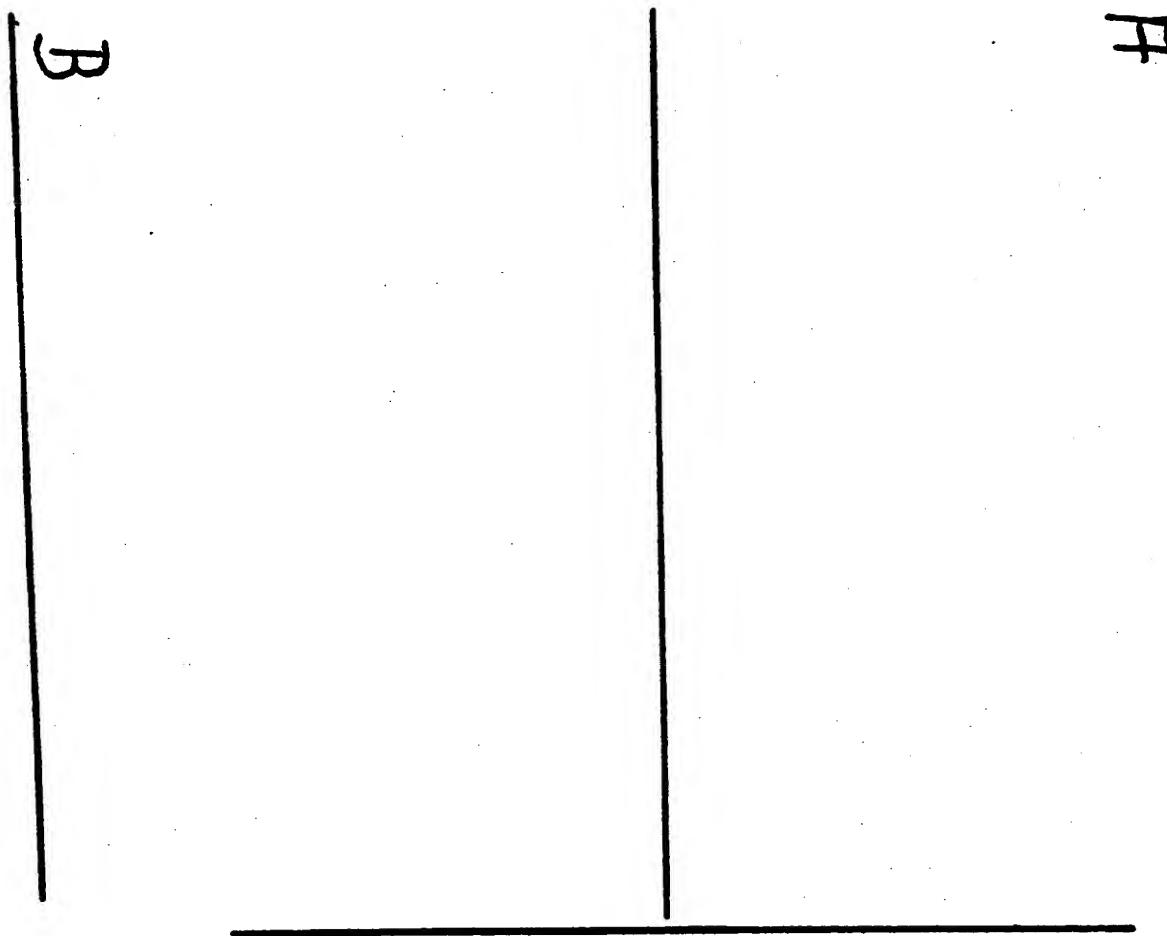


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Speech Control Board

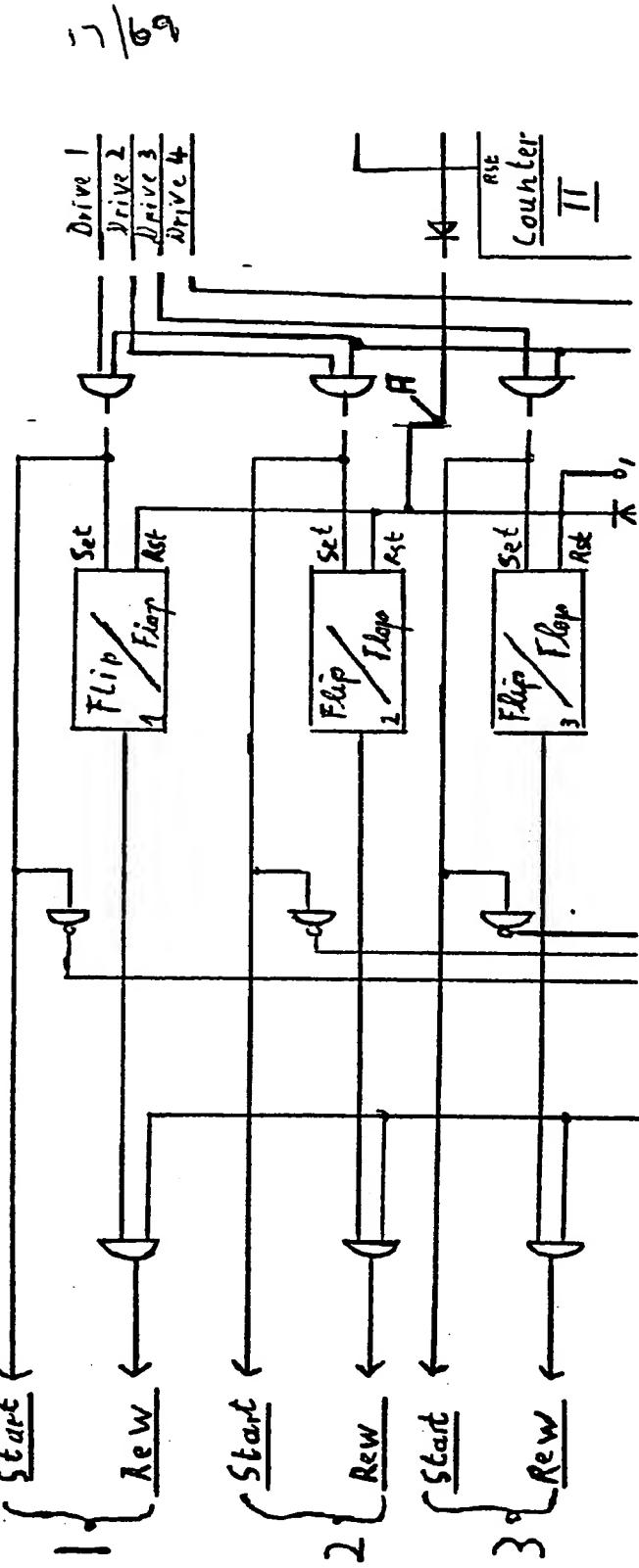
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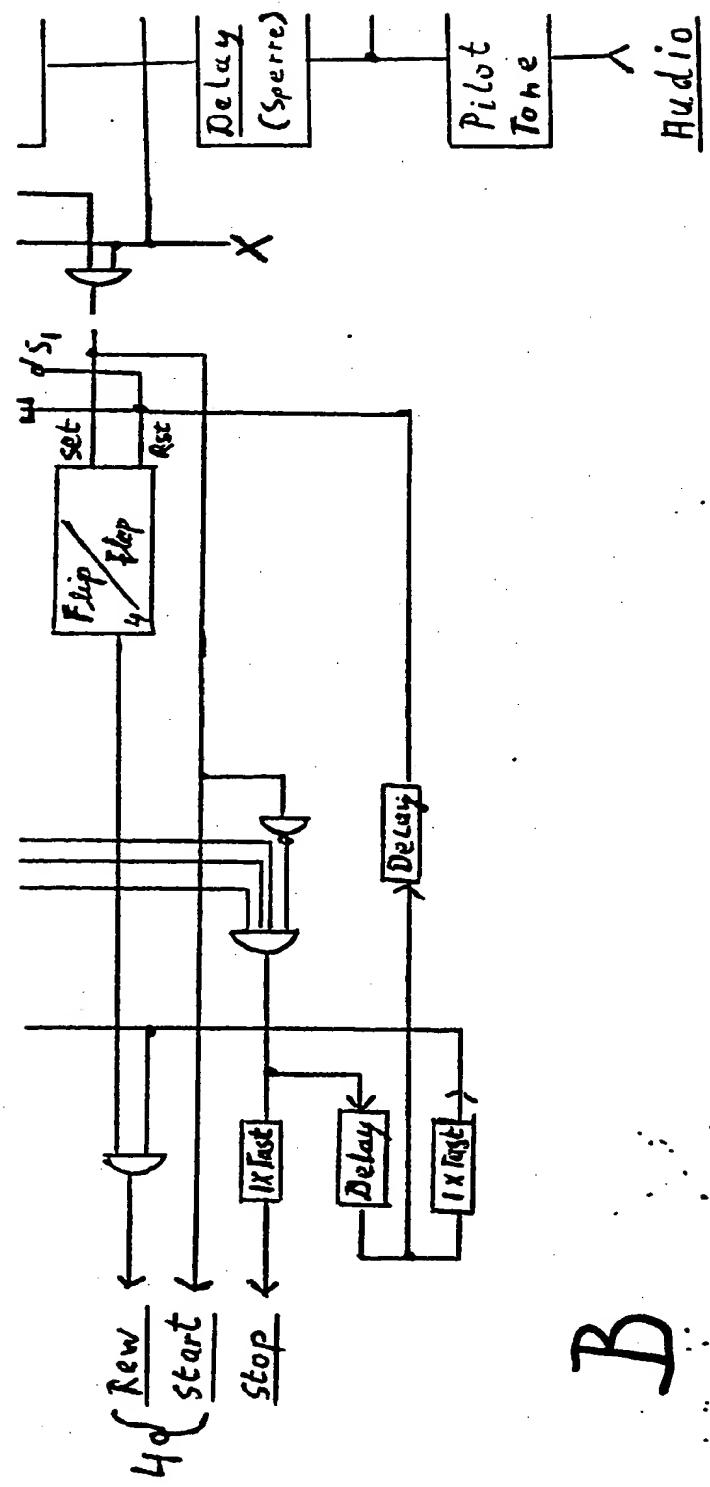
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# Speech Ctrl Board

A

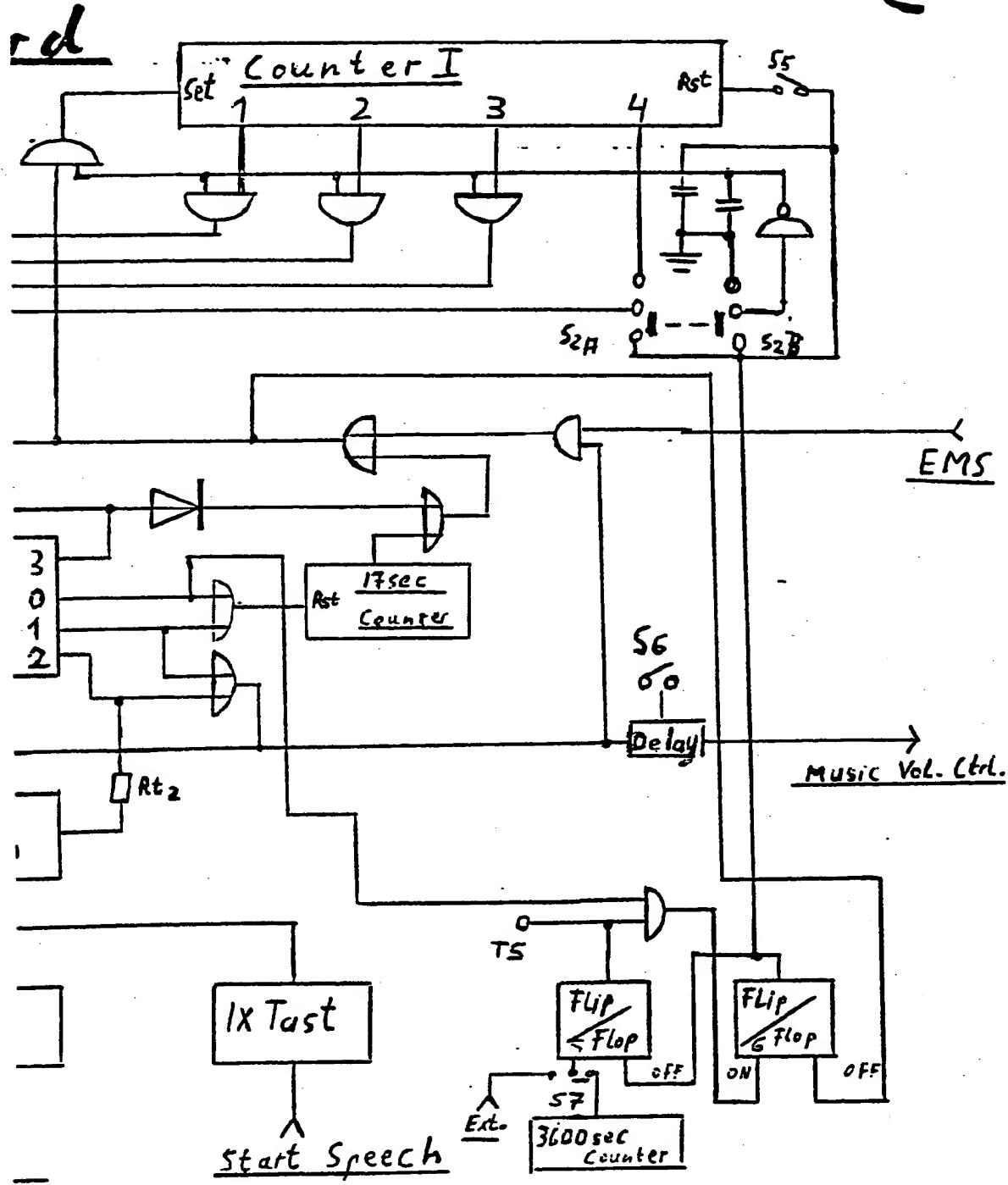


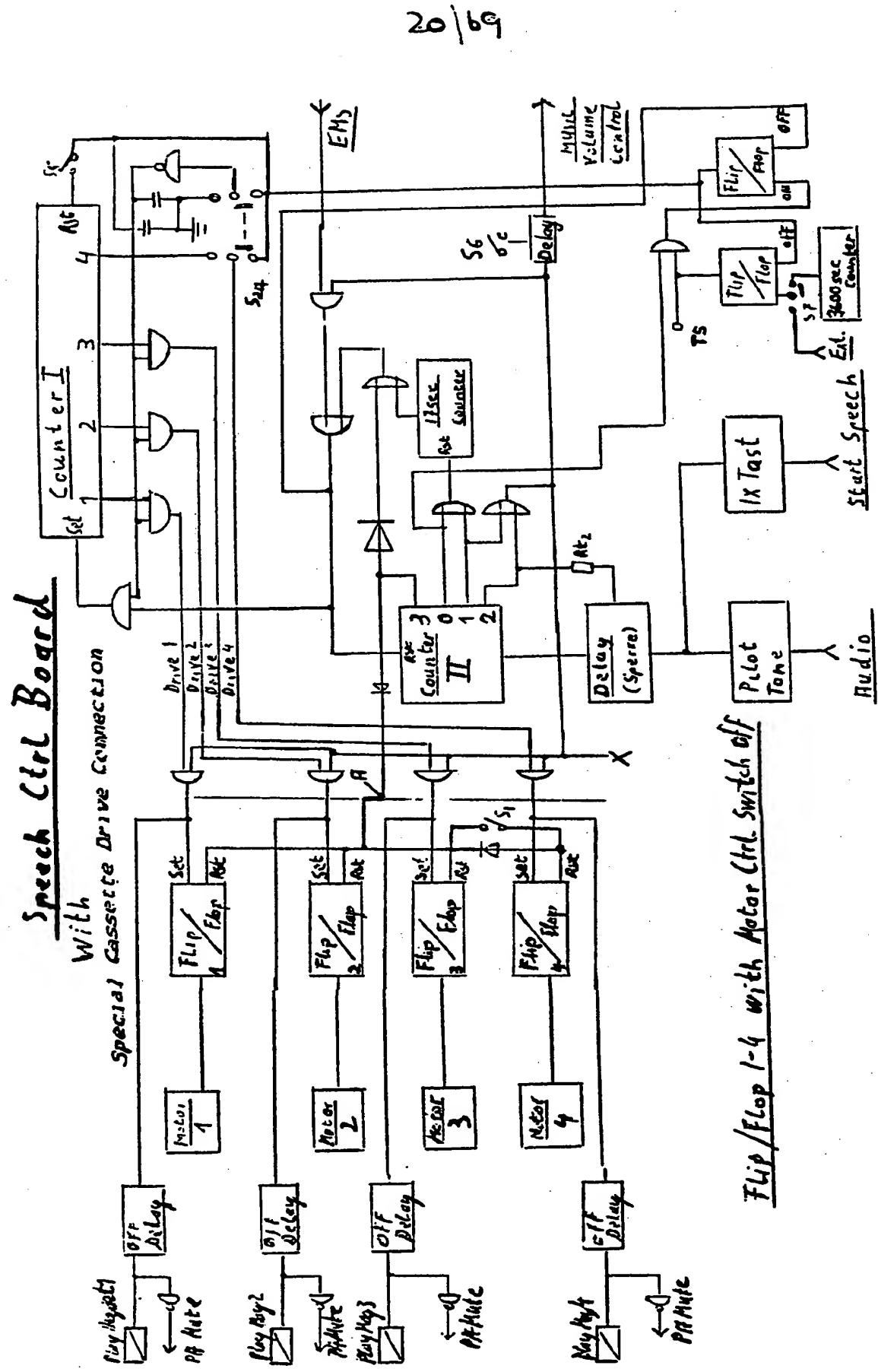
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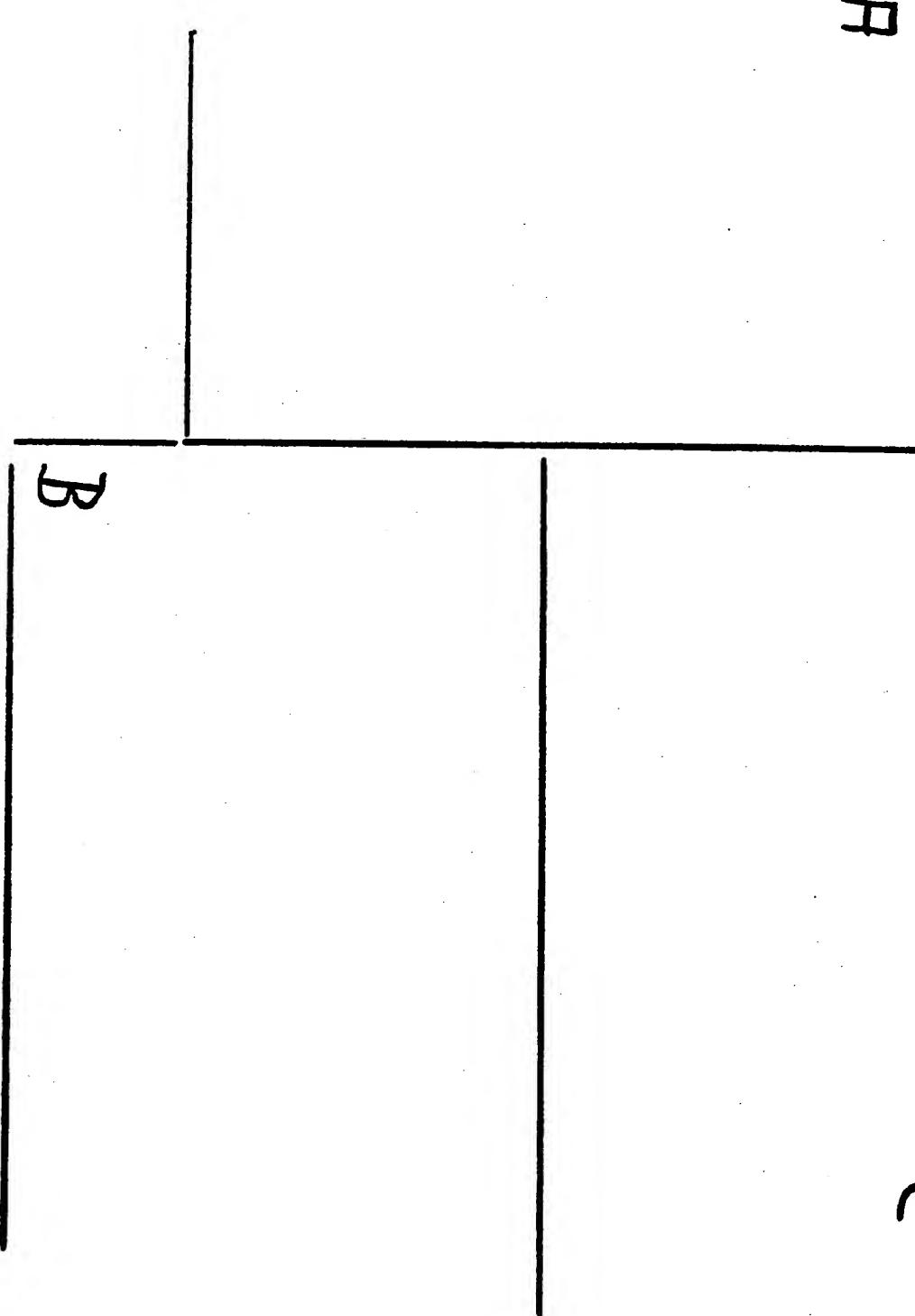




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Speech Control Board

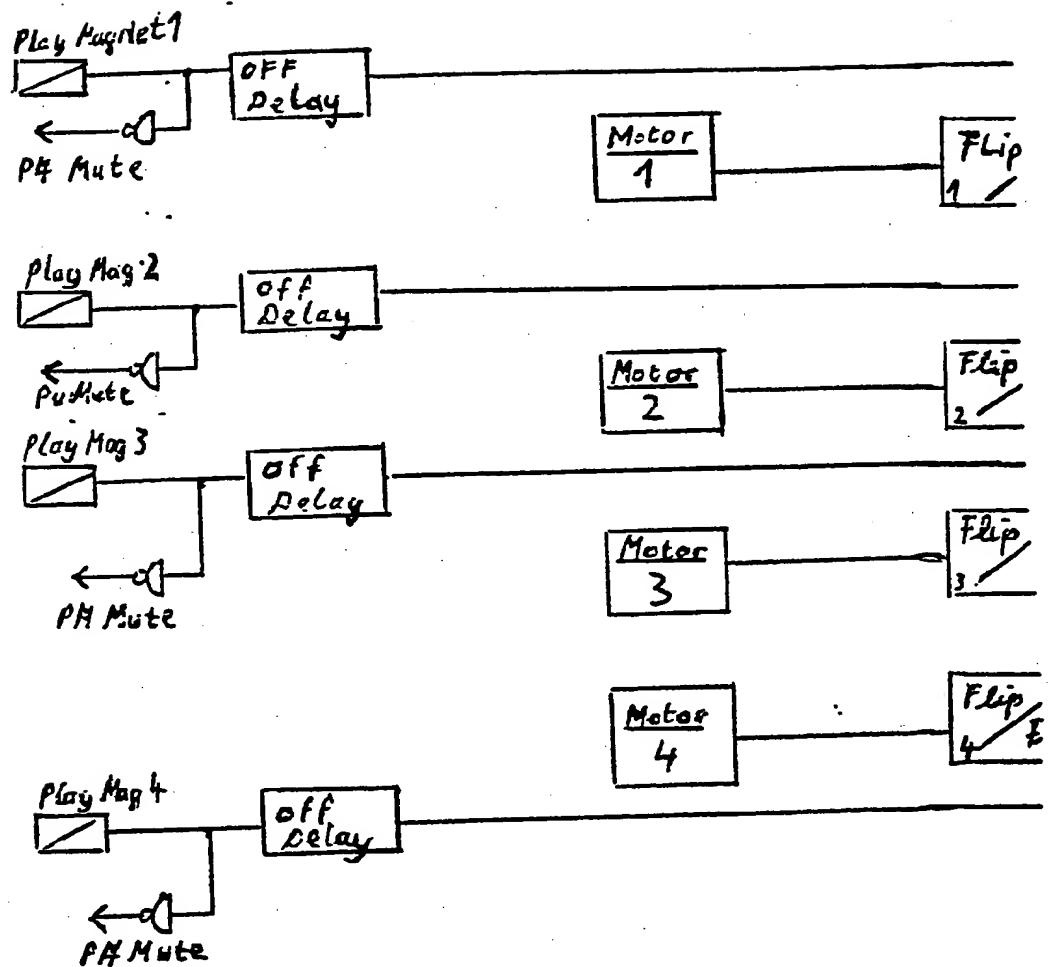
Block with Special Cassette Drive Connection



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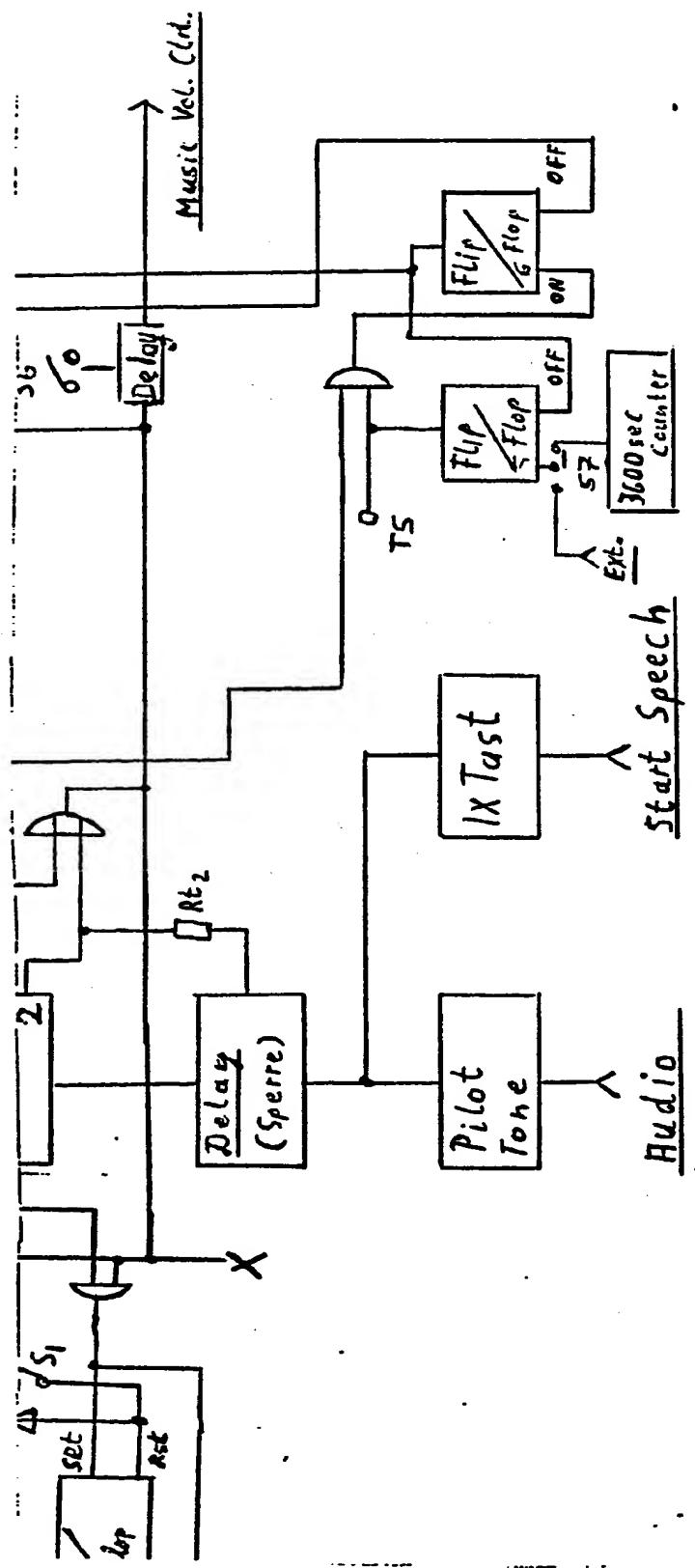
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Wit



Flip Flop 1-4 with Motor Ctrl Switch off

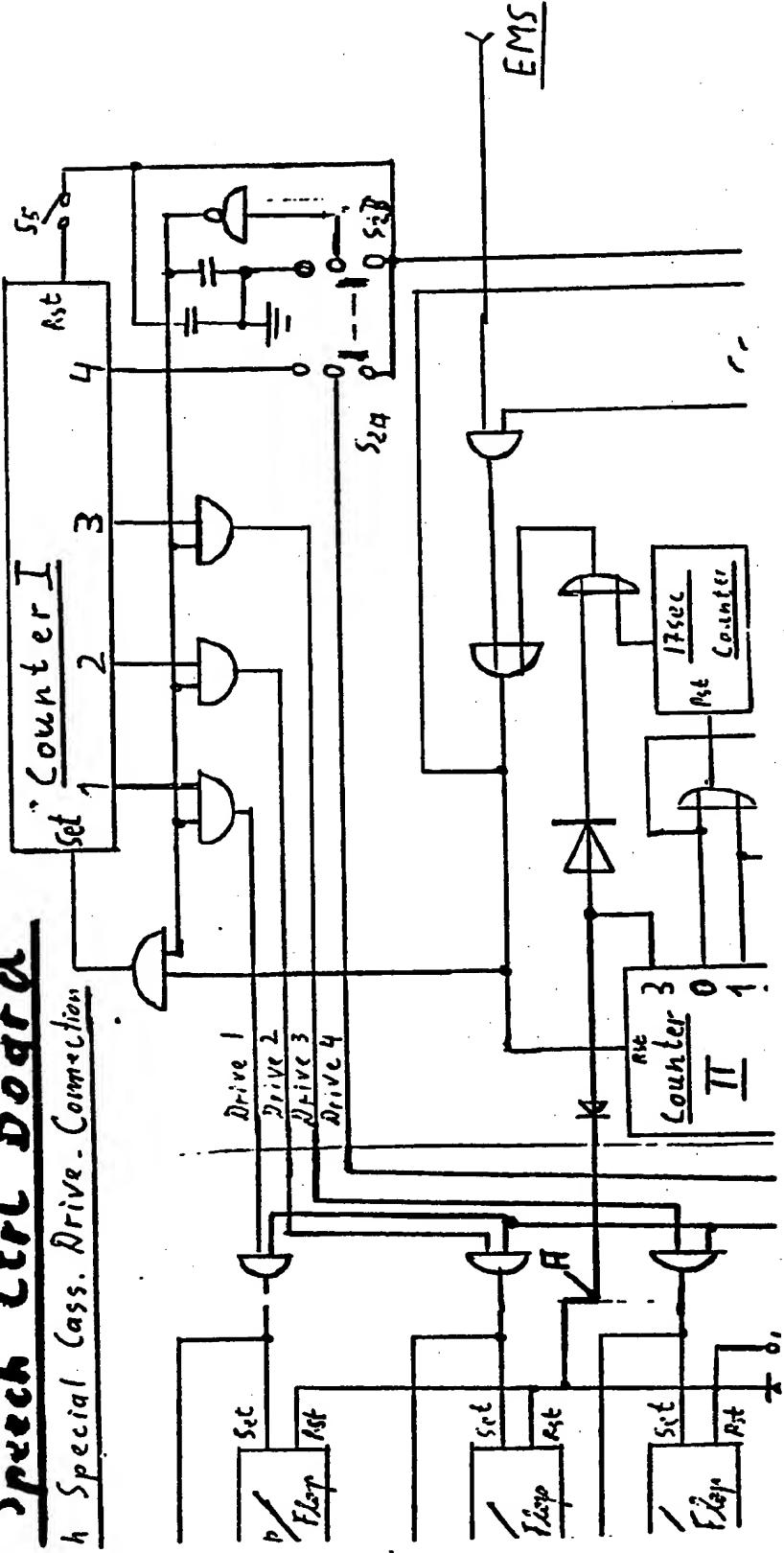
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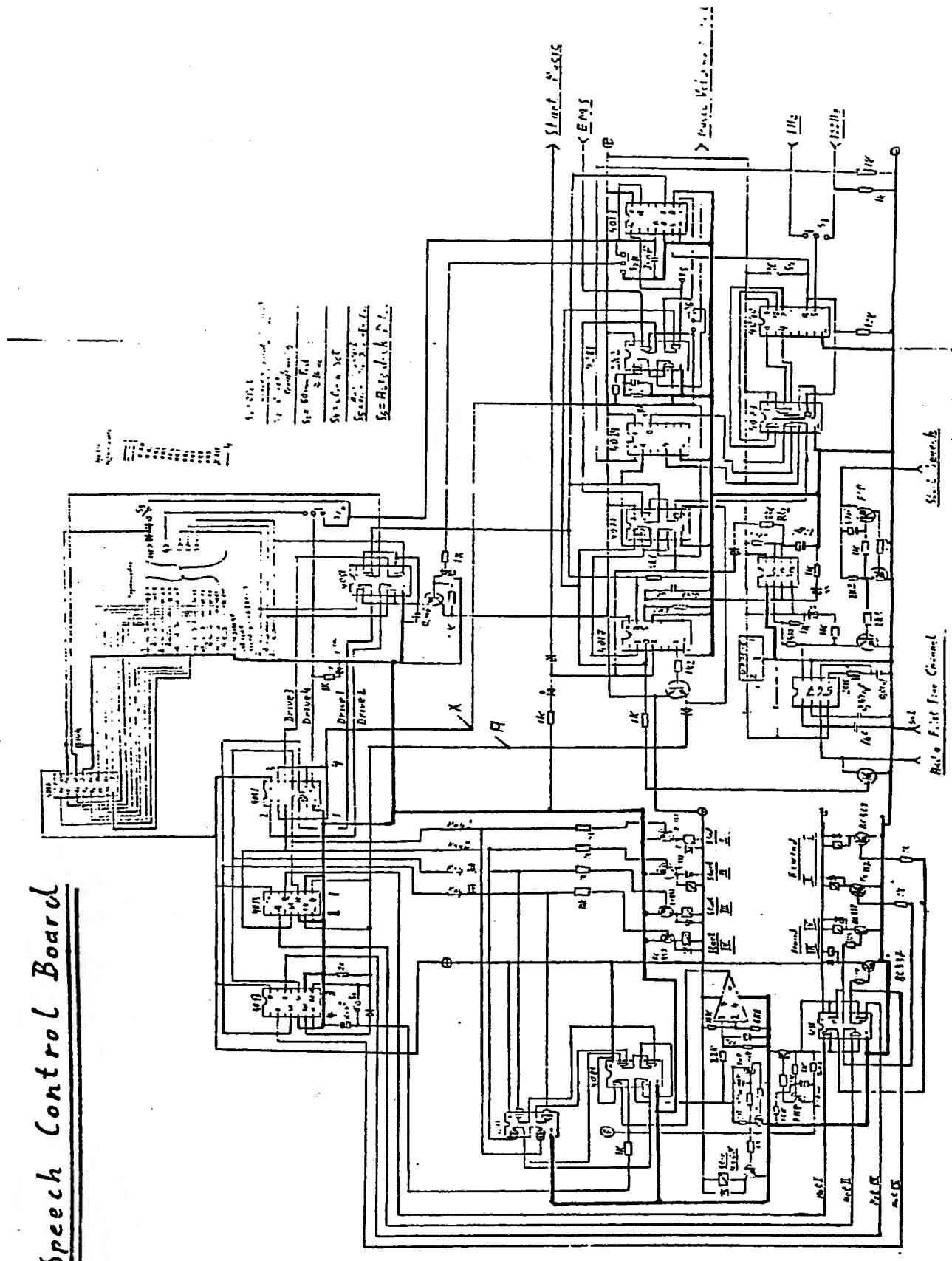
## Speech Ctrl Board

Special Cass. Drive Connection



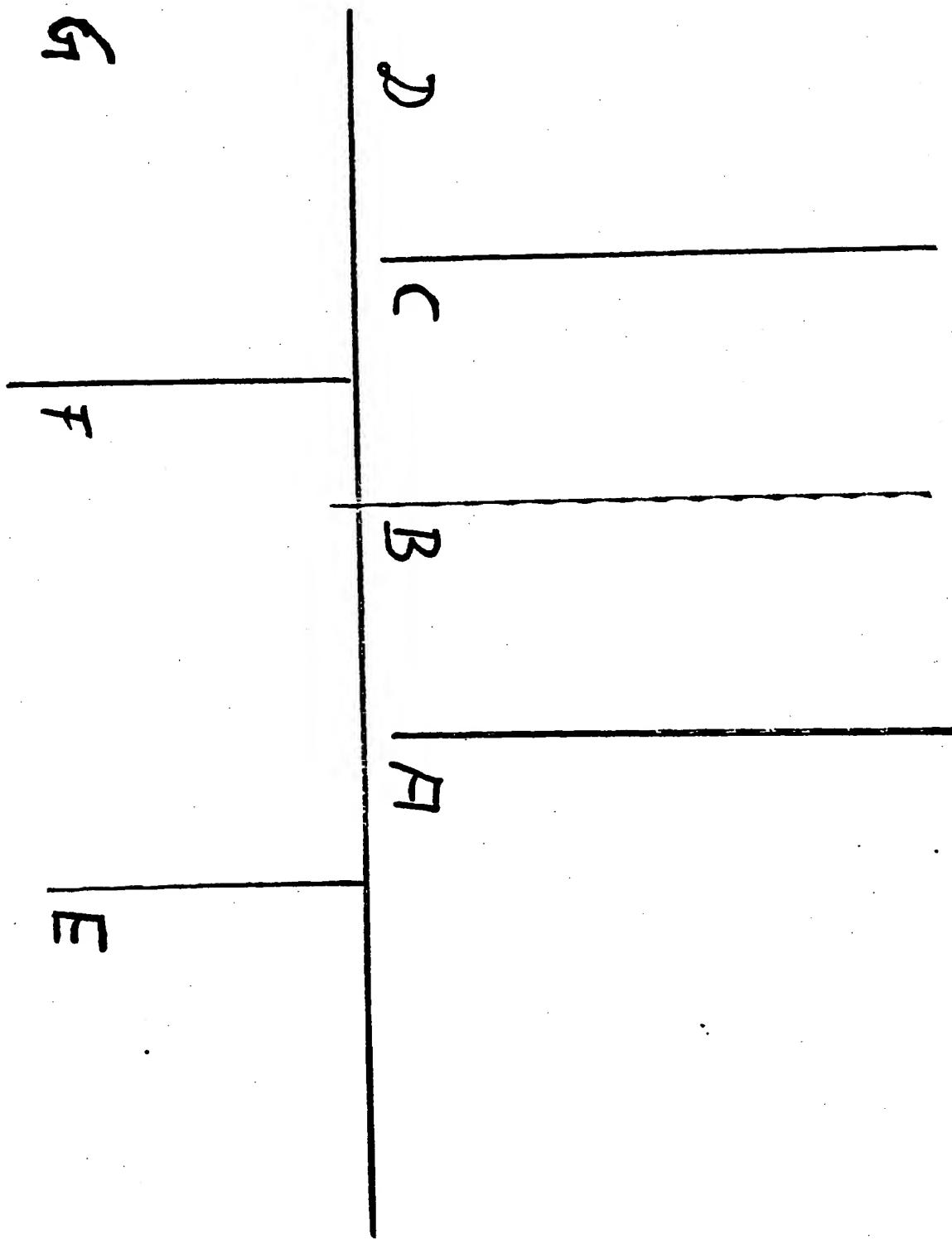
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## Speech Control Board

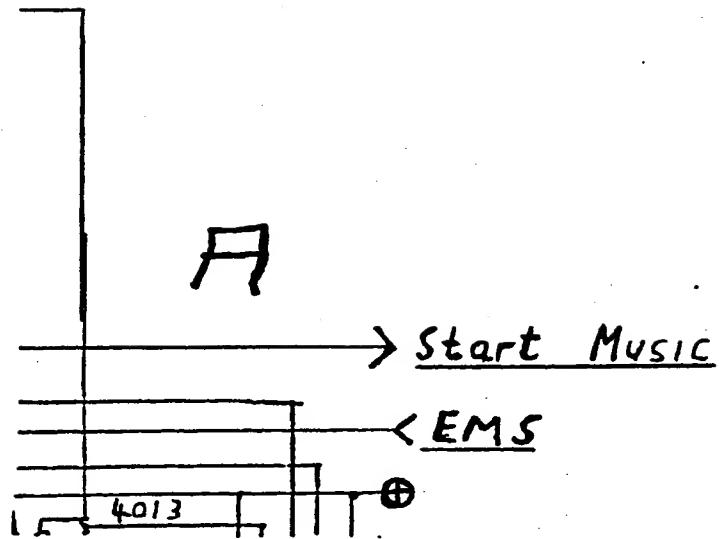


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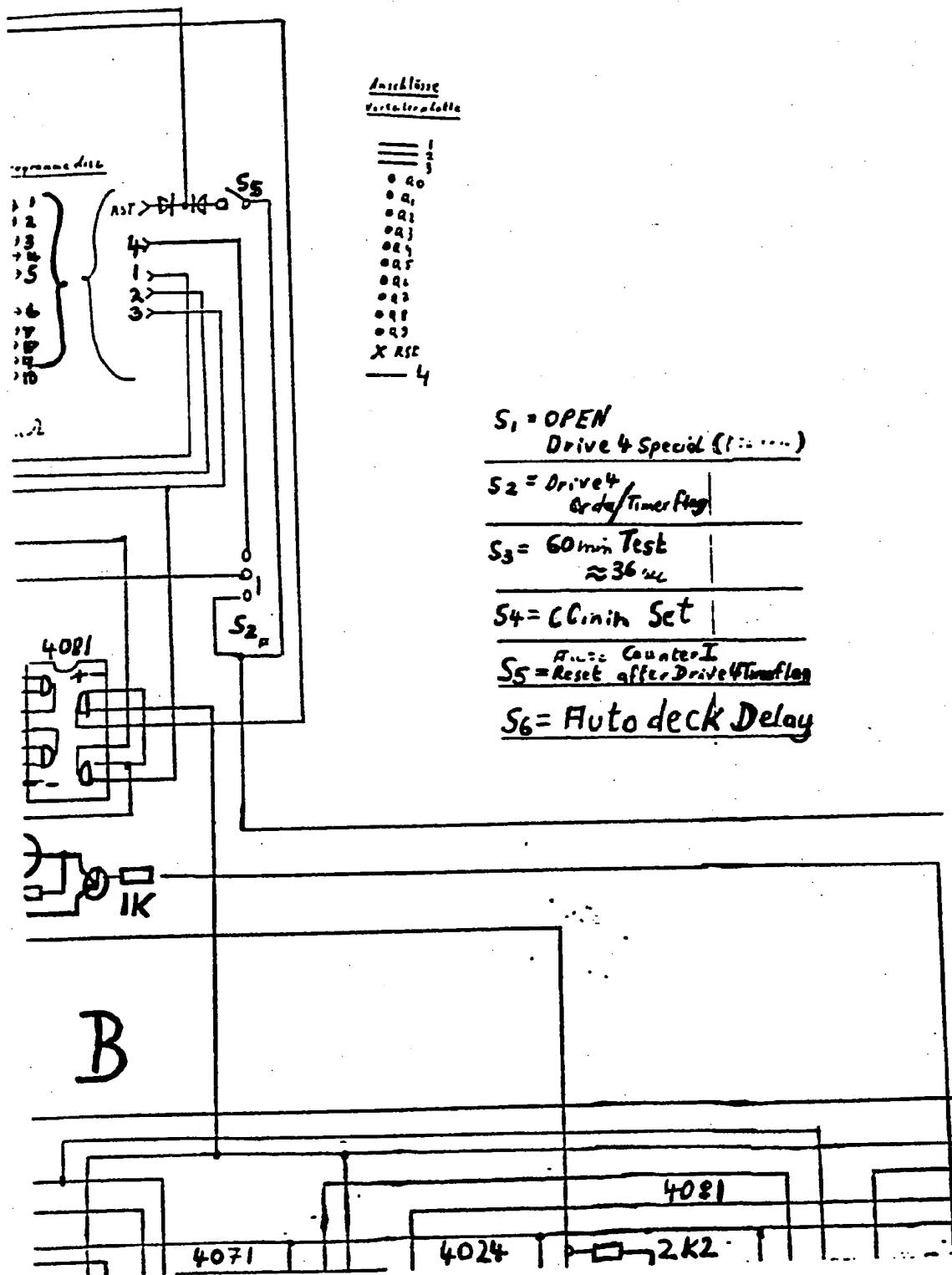
Speech Control Board



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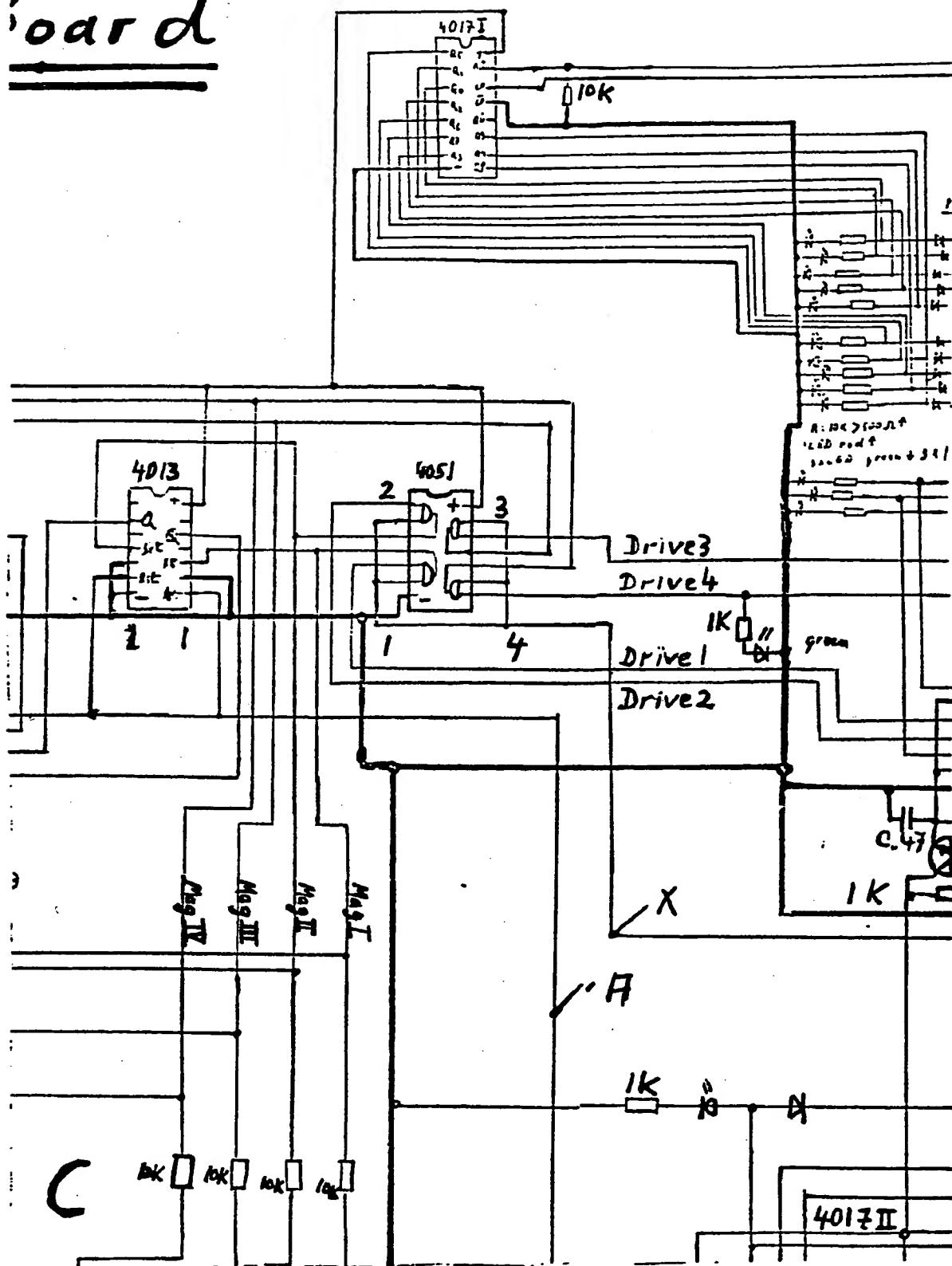


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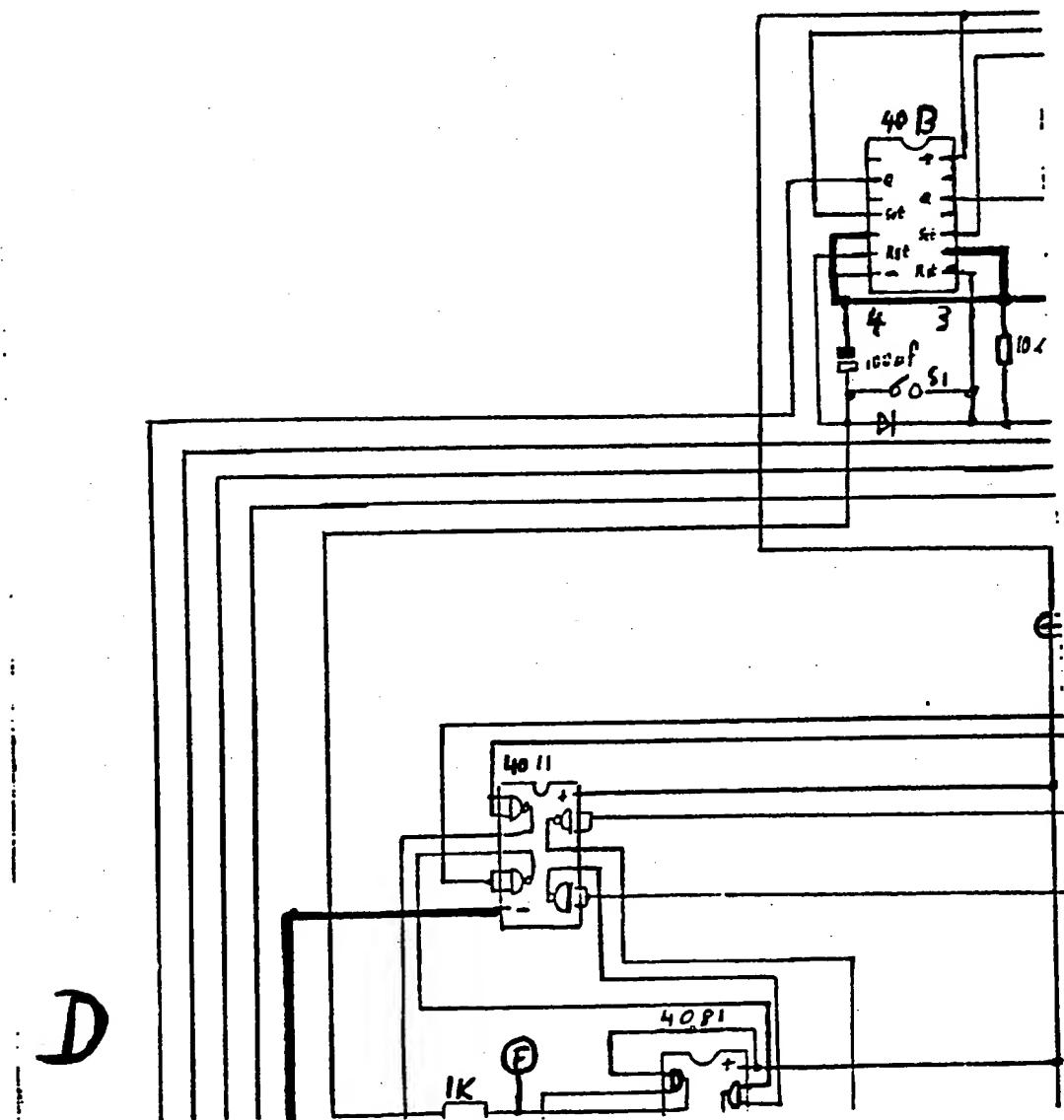
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board

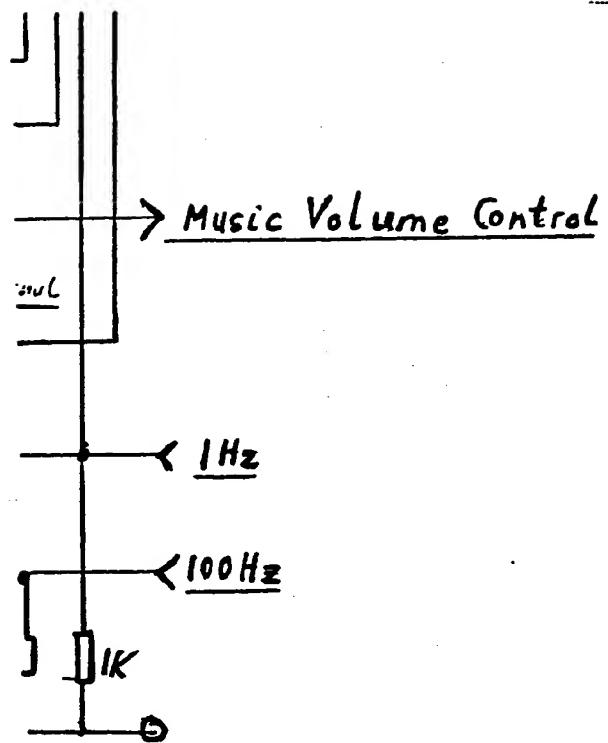


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# Speech Control B

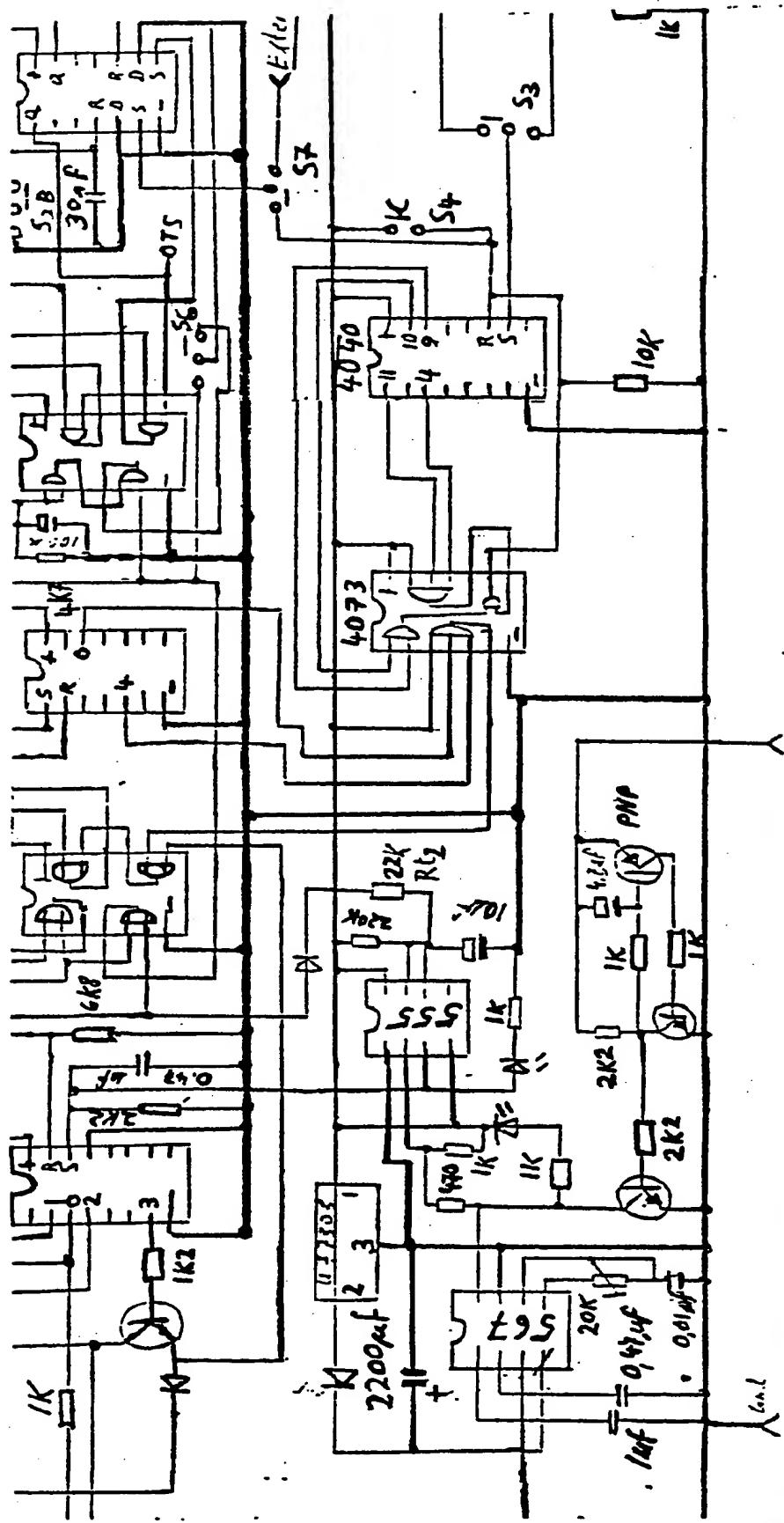


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E

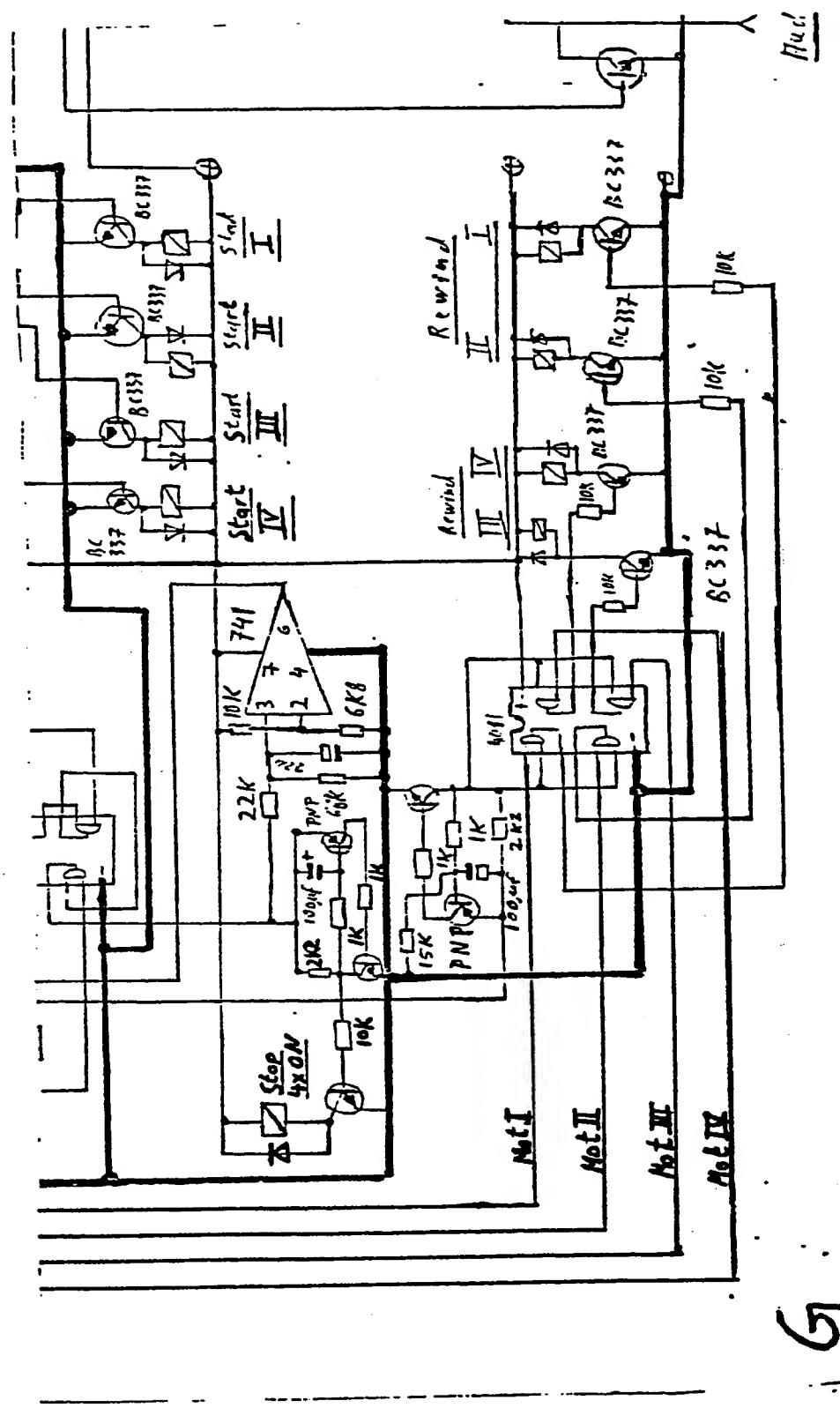
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## 100 Pilot Tone Channel

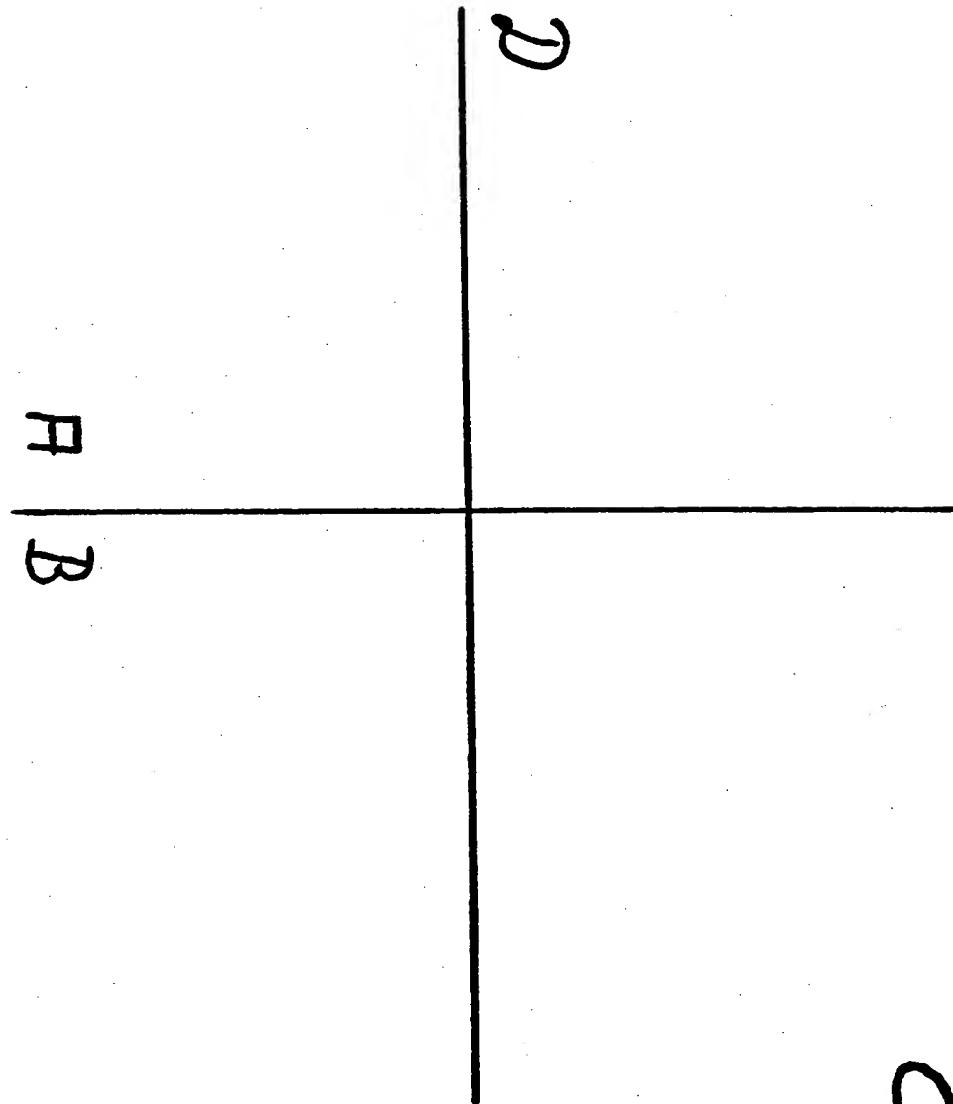
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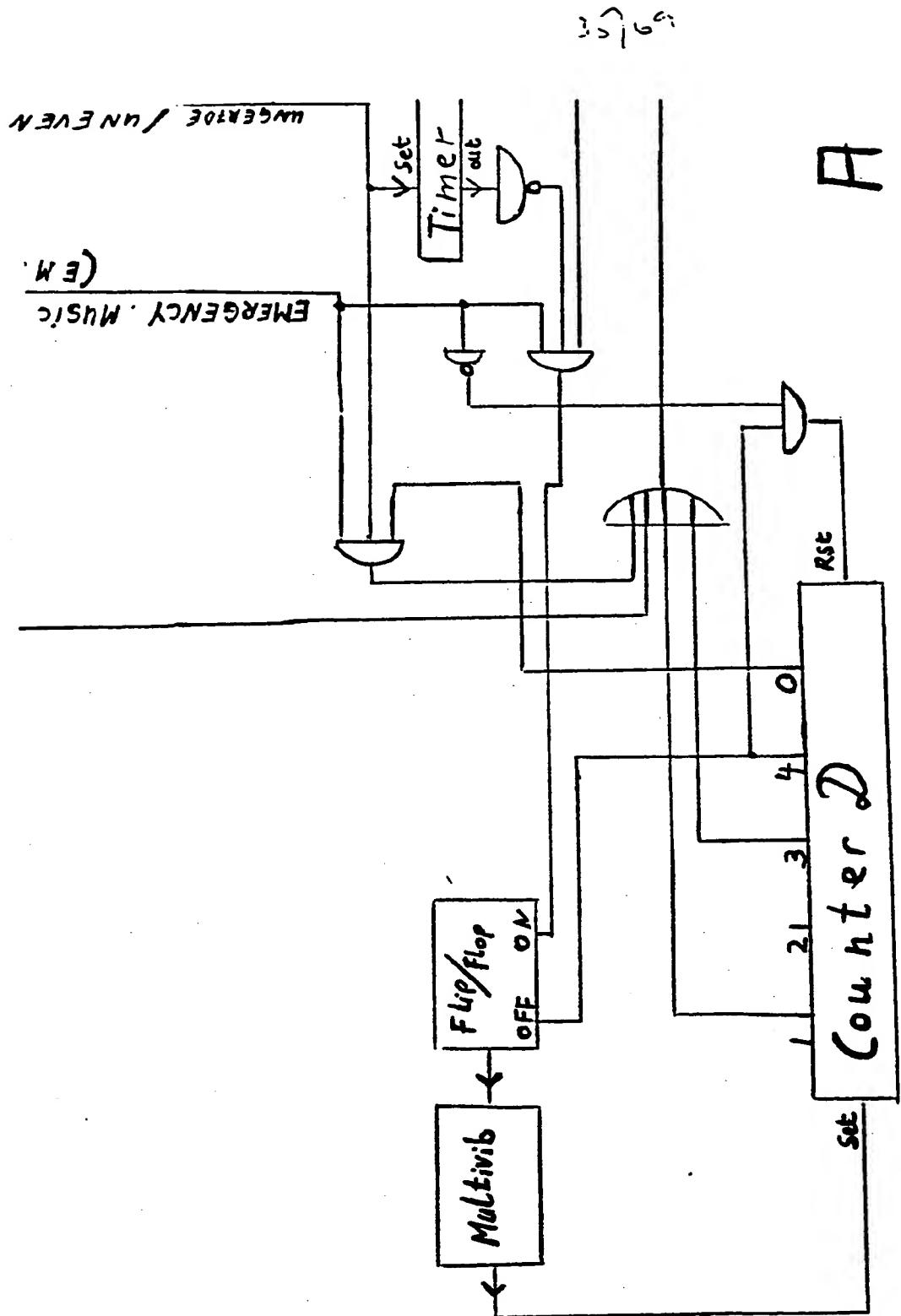
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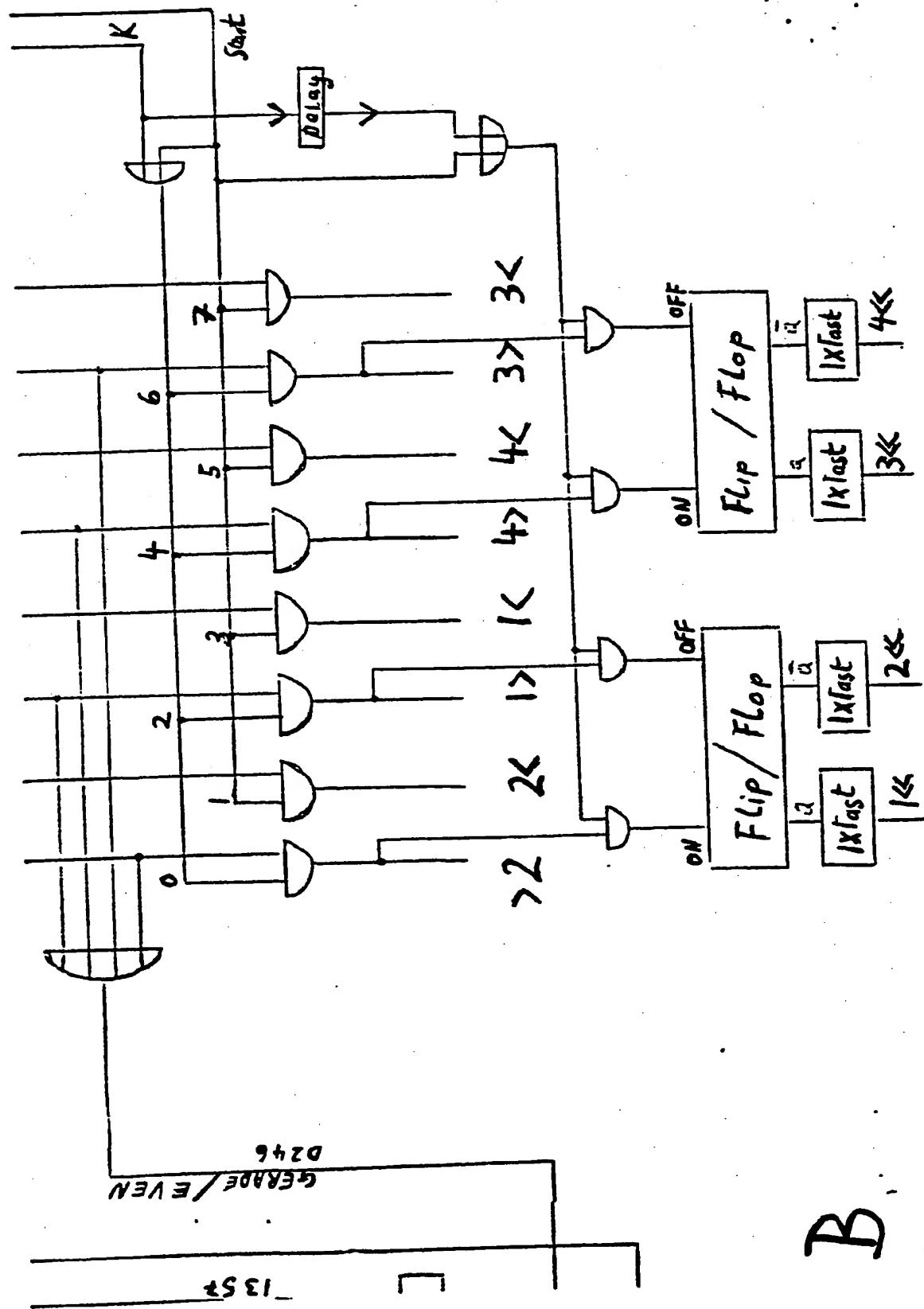
Music Play Back Counter (Block)



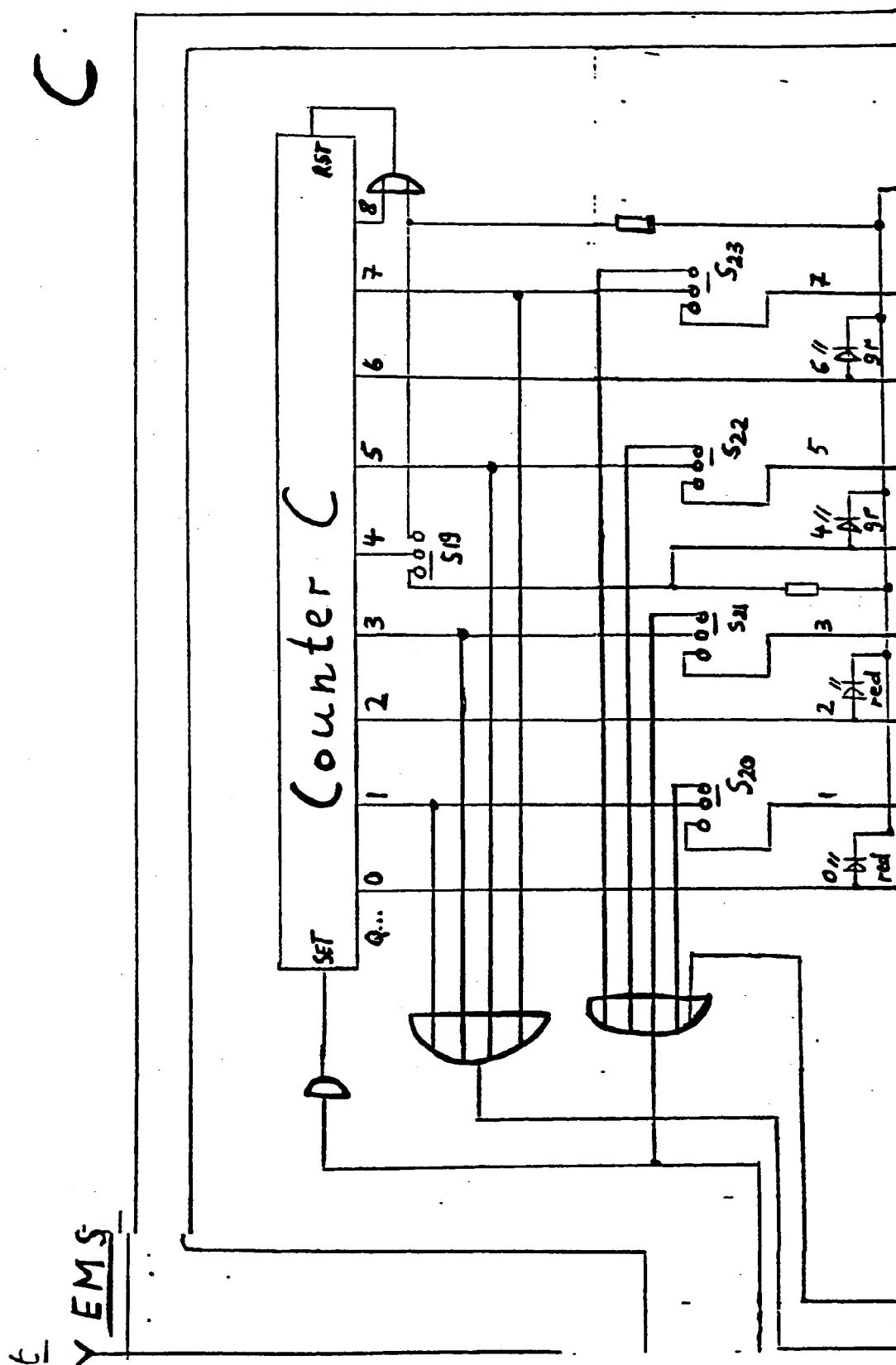


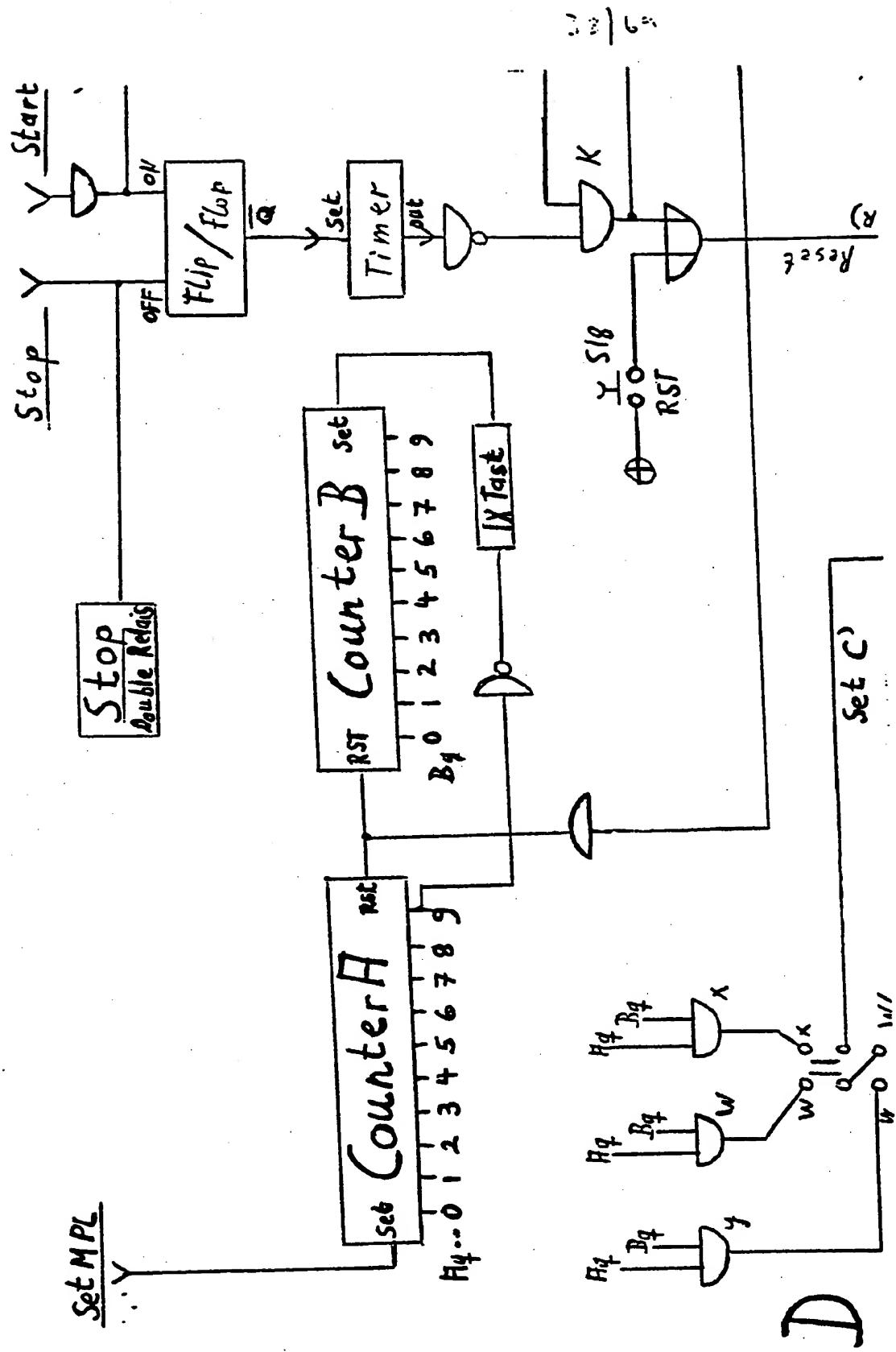
Music Playback Counter — Block diagram-

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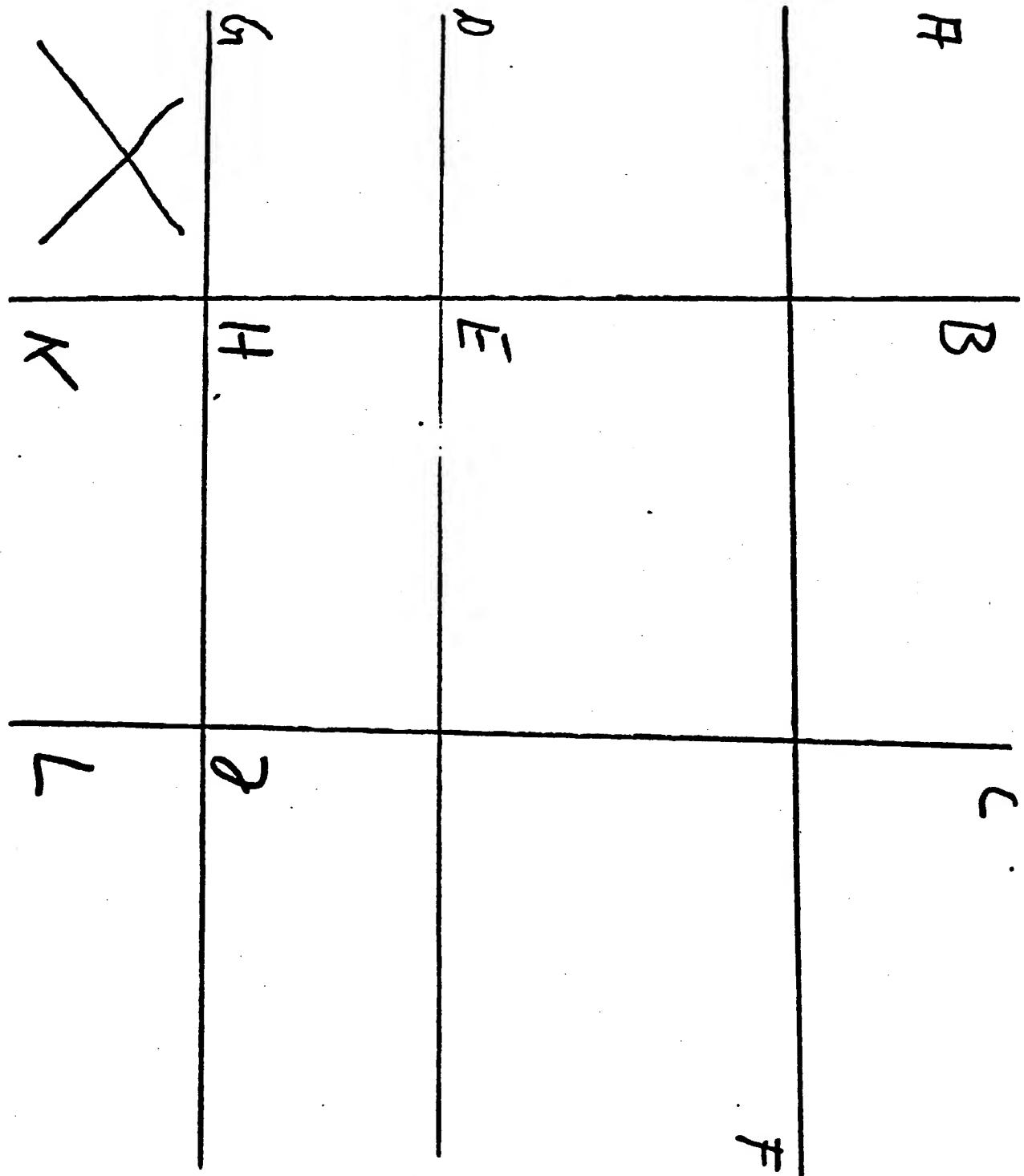
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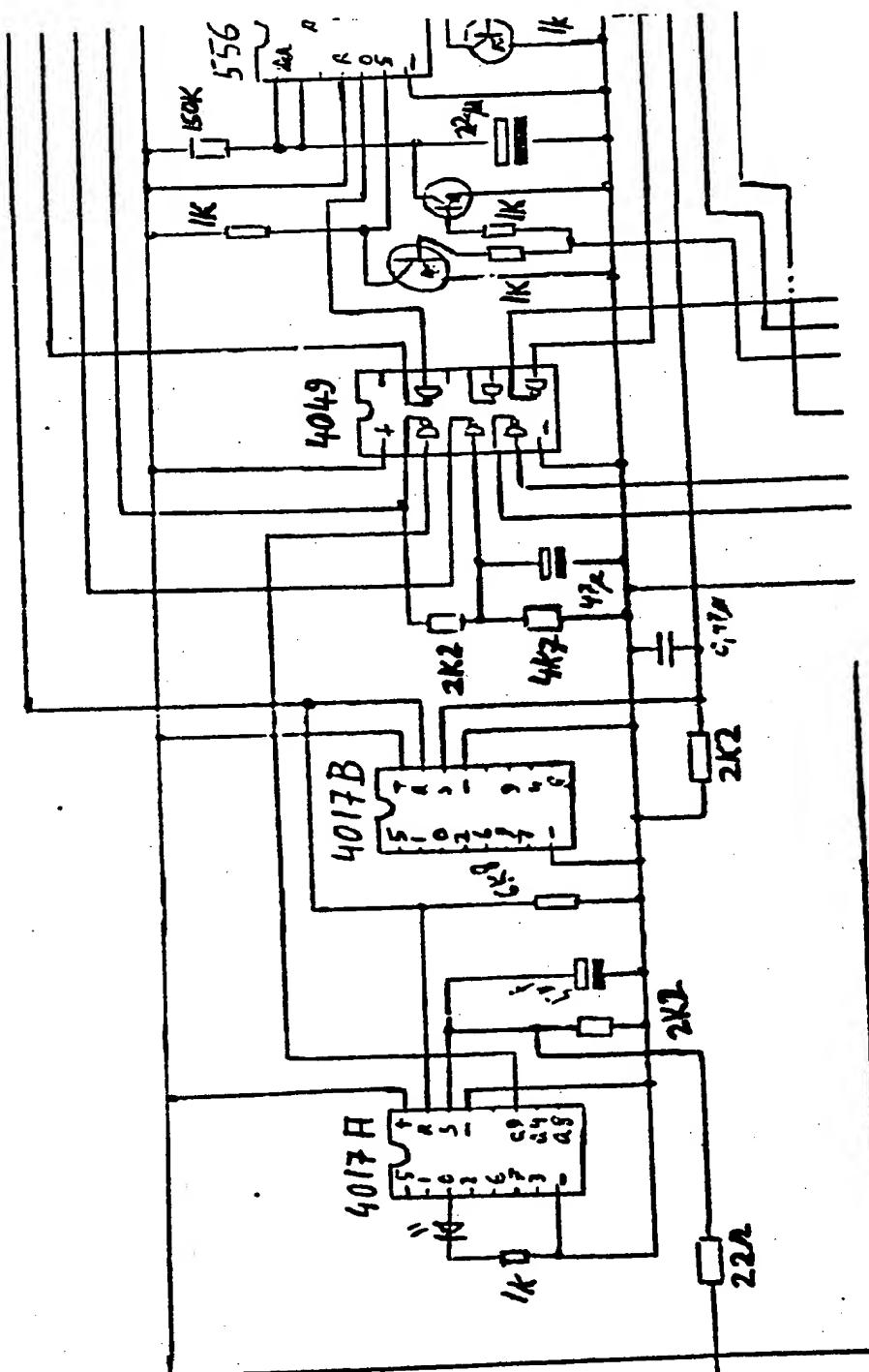


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Music Play Back Counter



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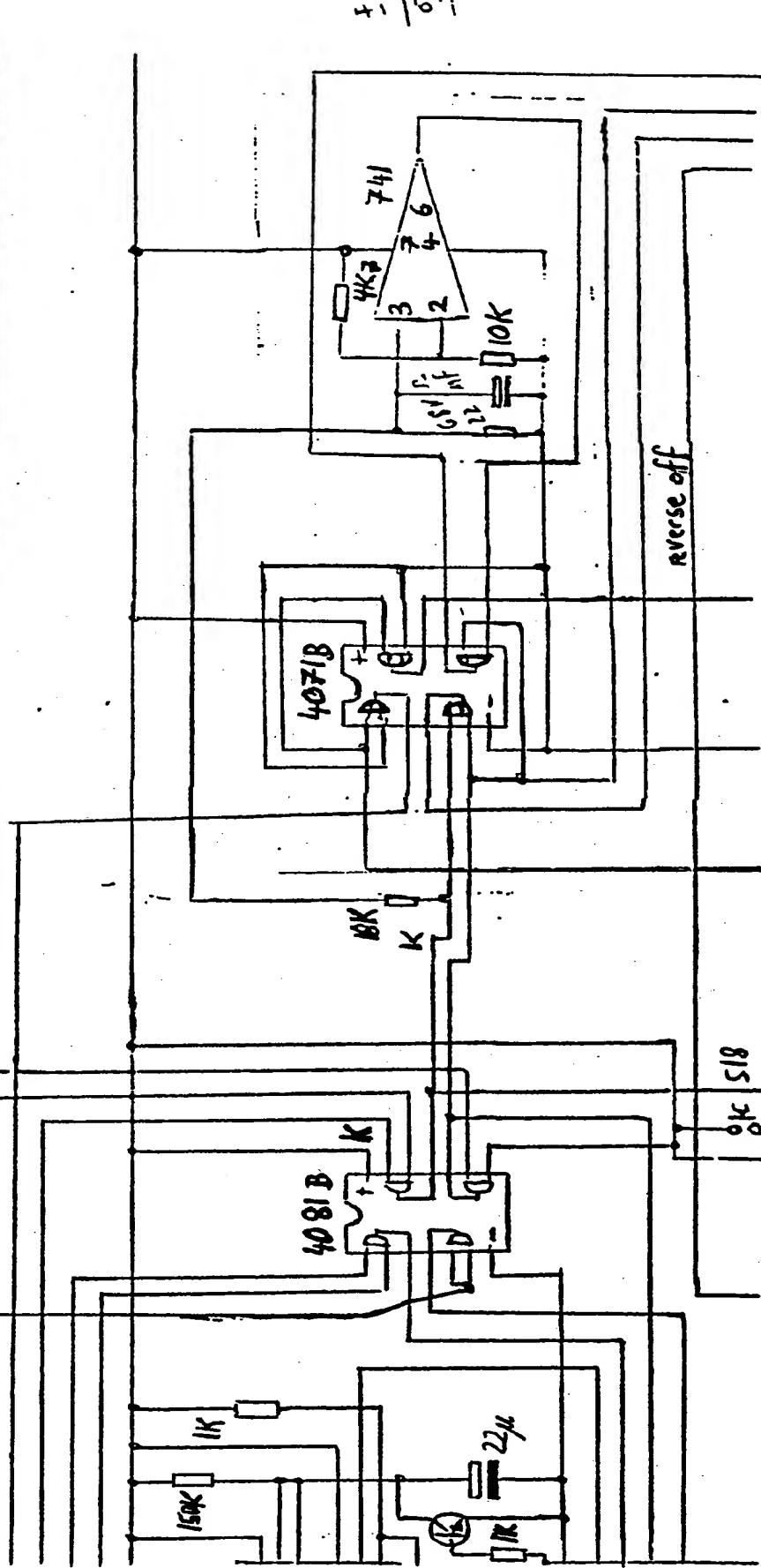
9) SET

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B

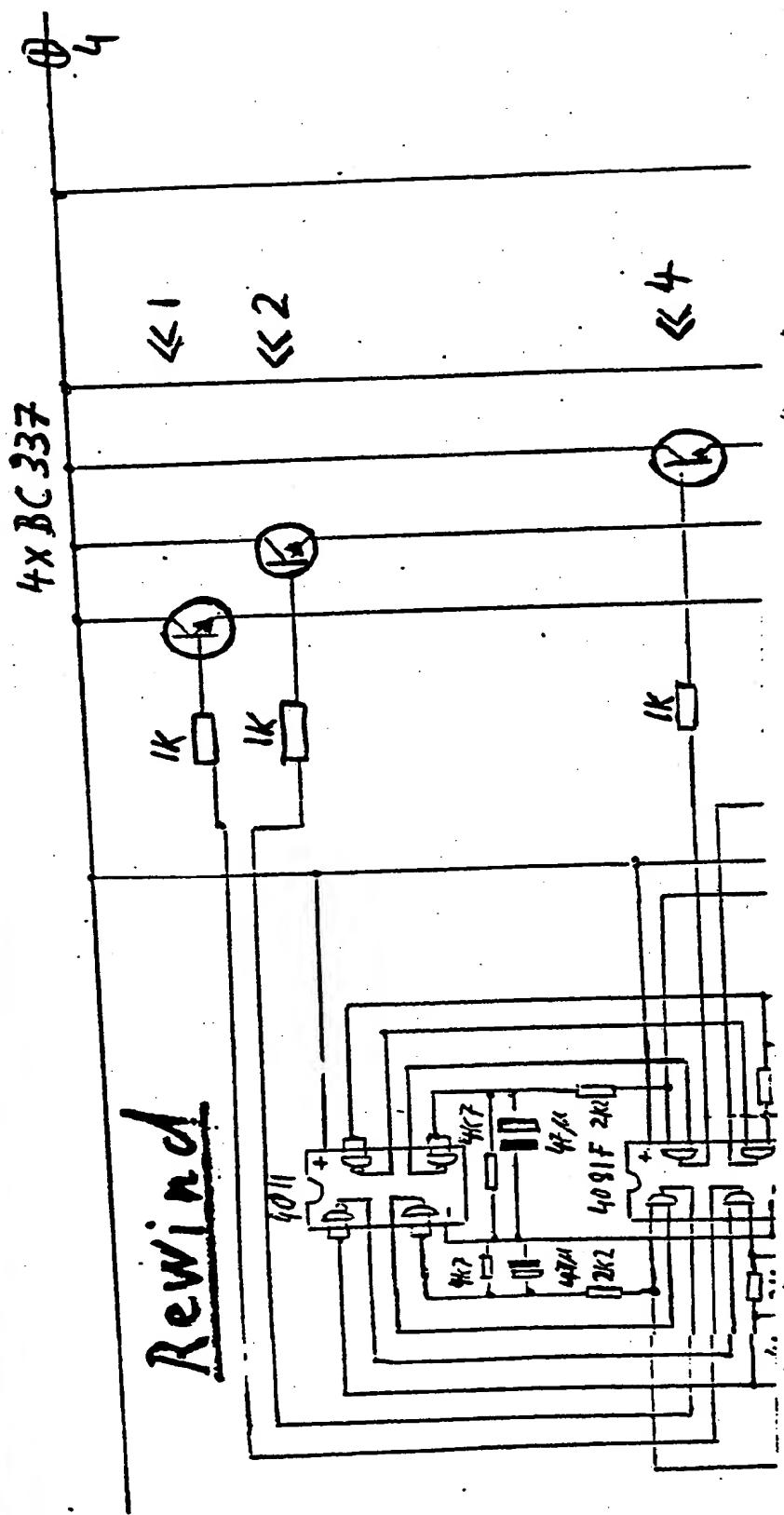
# Music - Play

8) Stop 7) EMS 6) Start

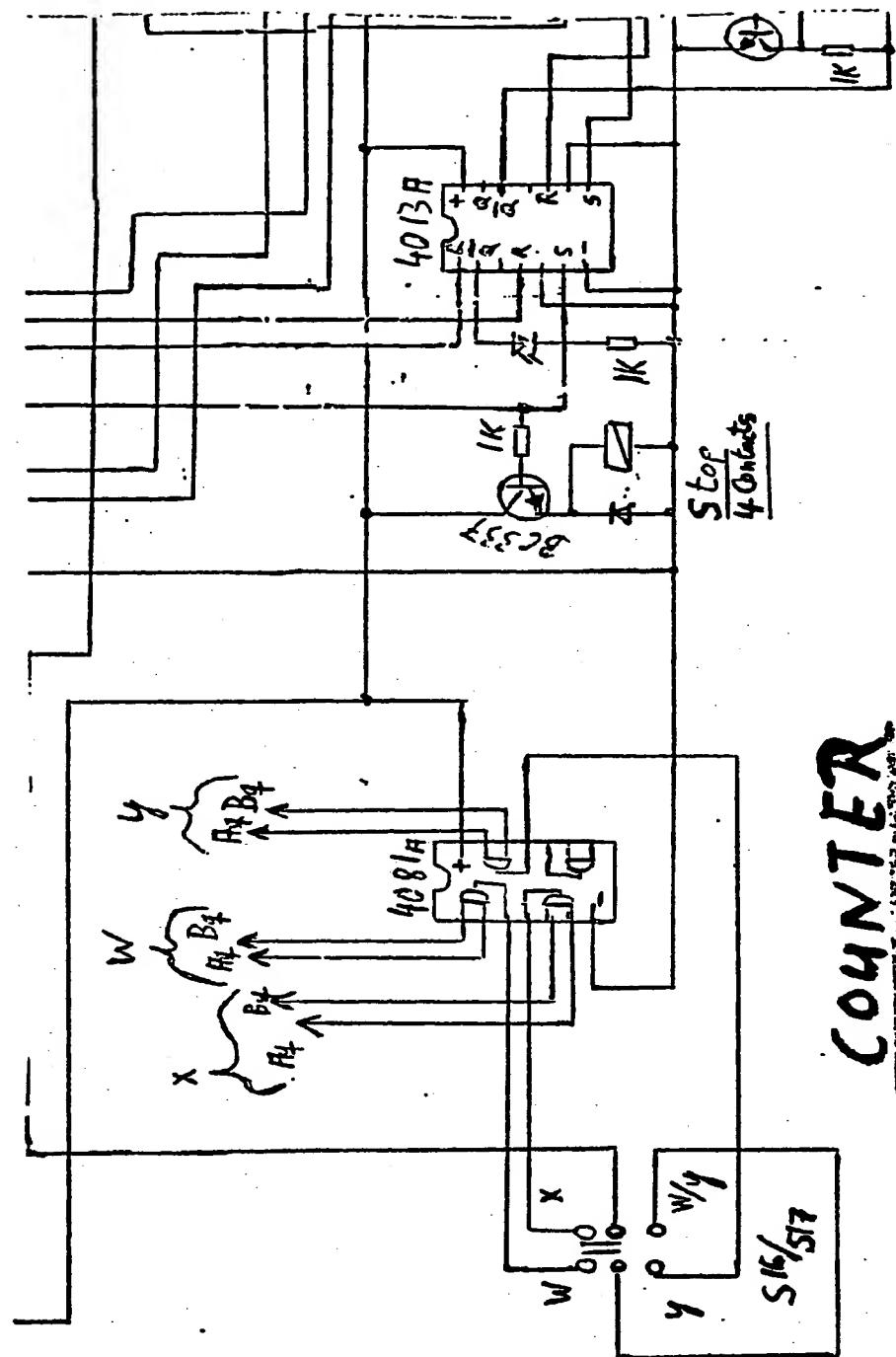


Stack-Counter (Mpc)

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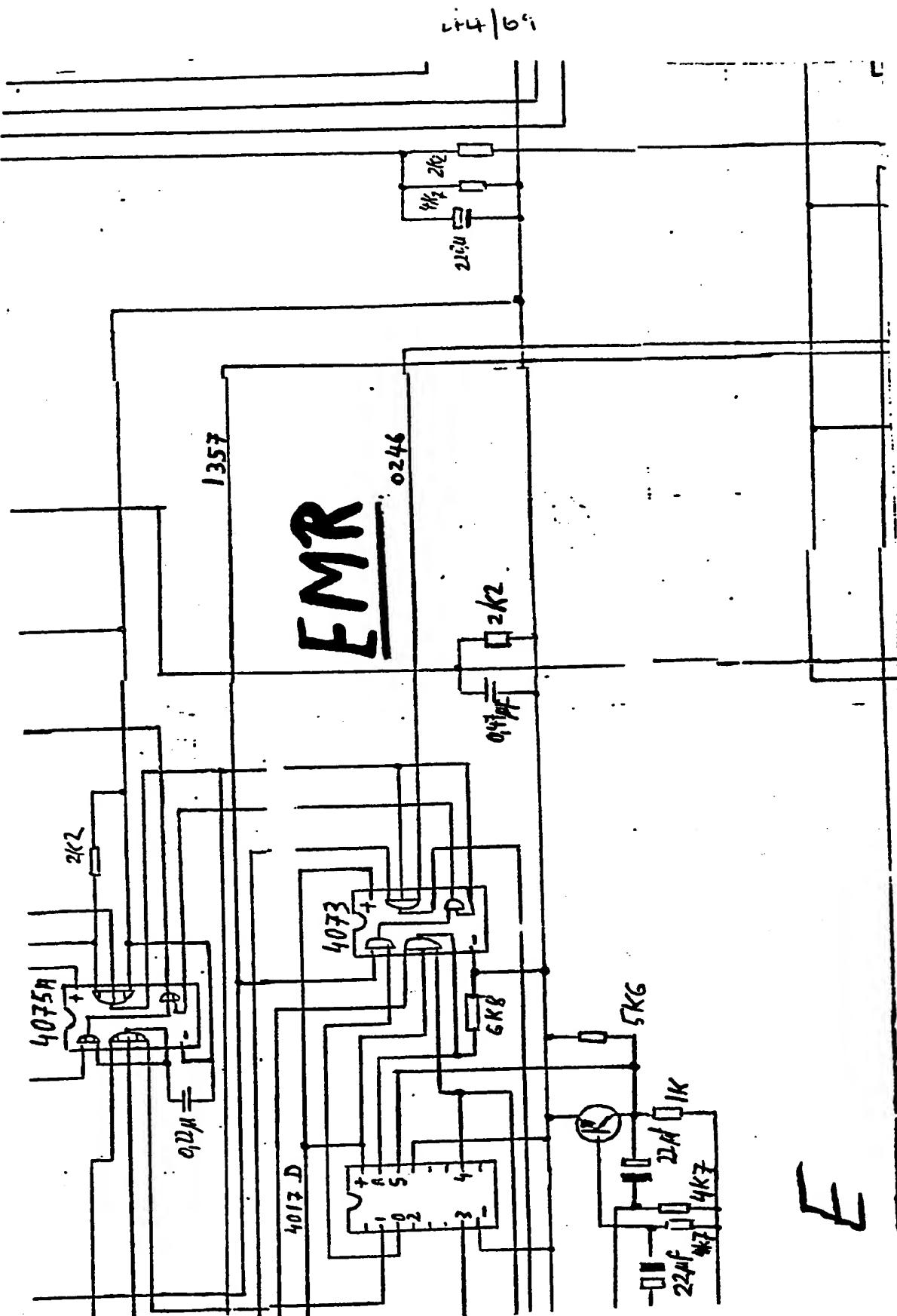


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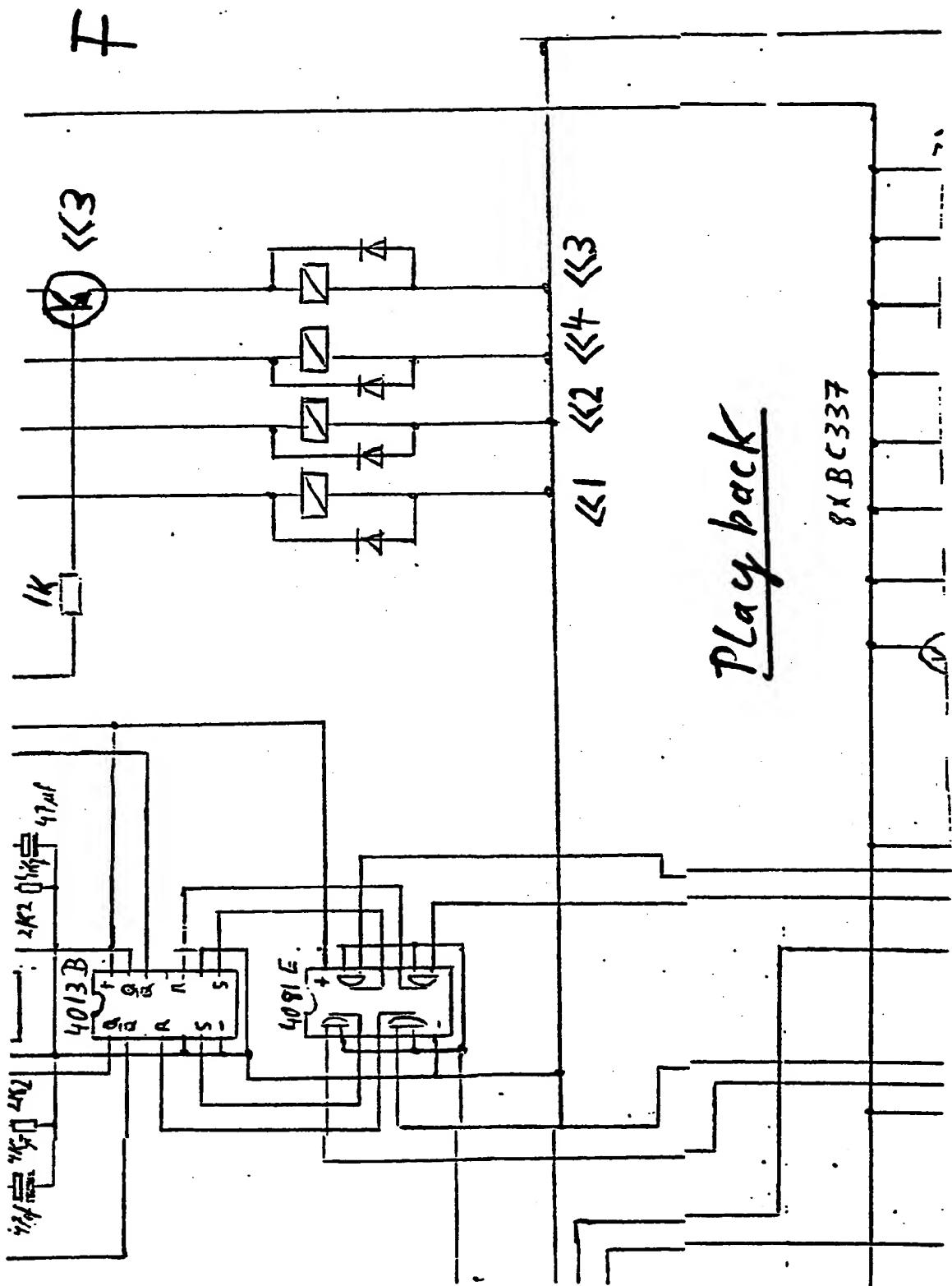


COUNTER

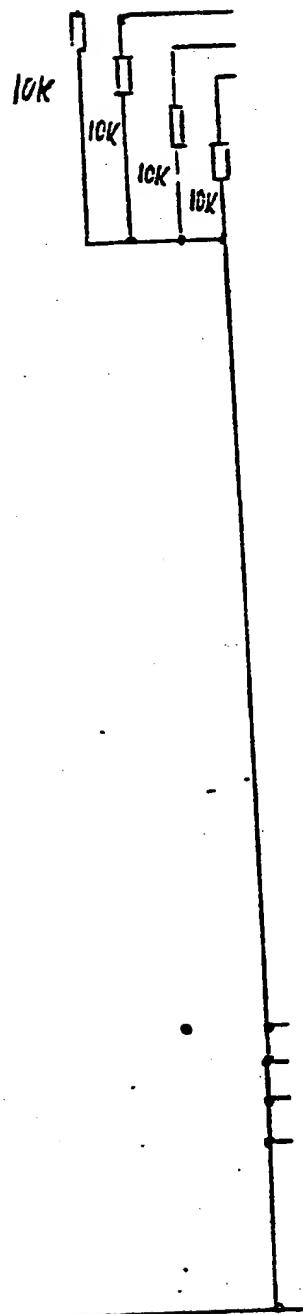
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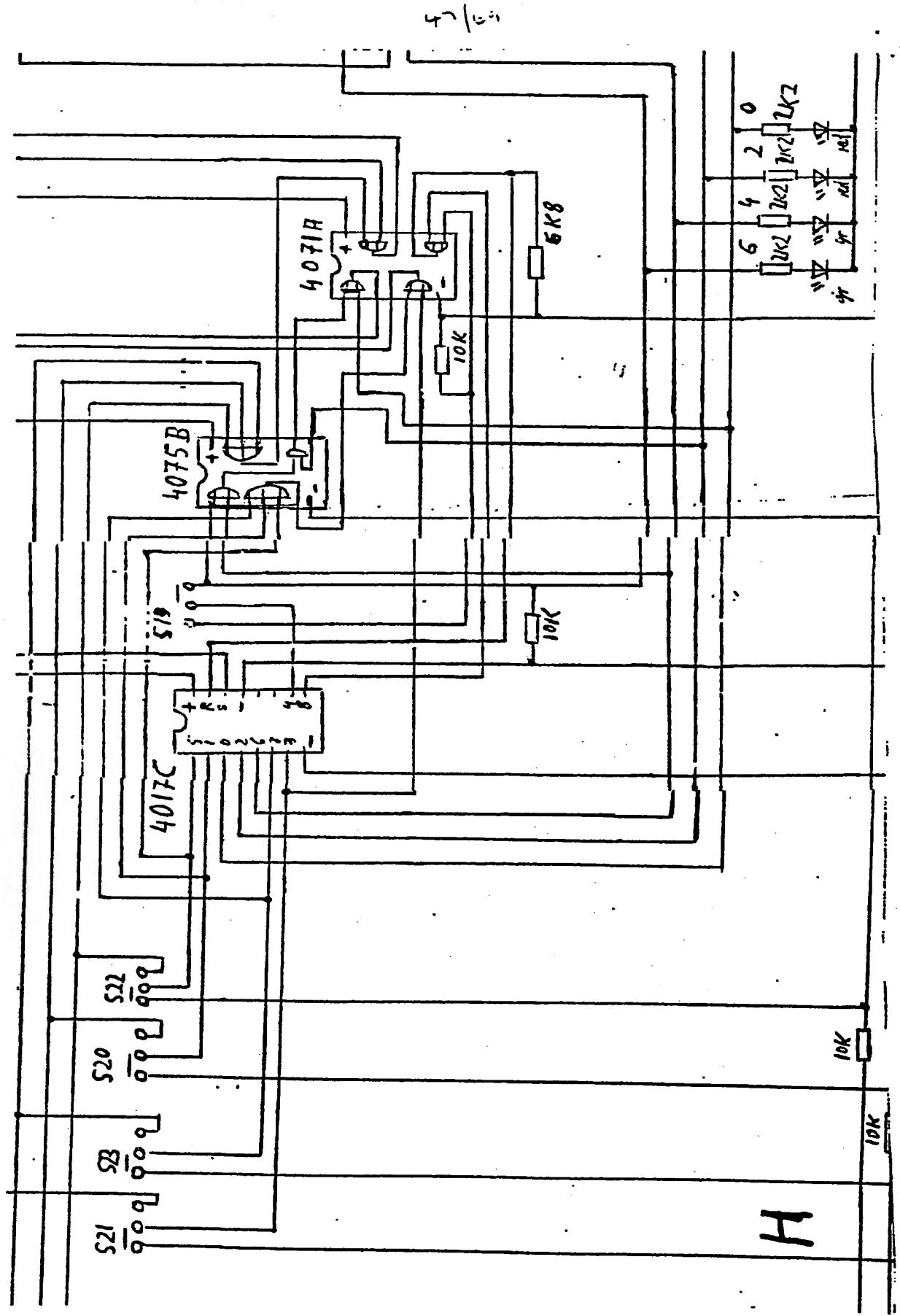
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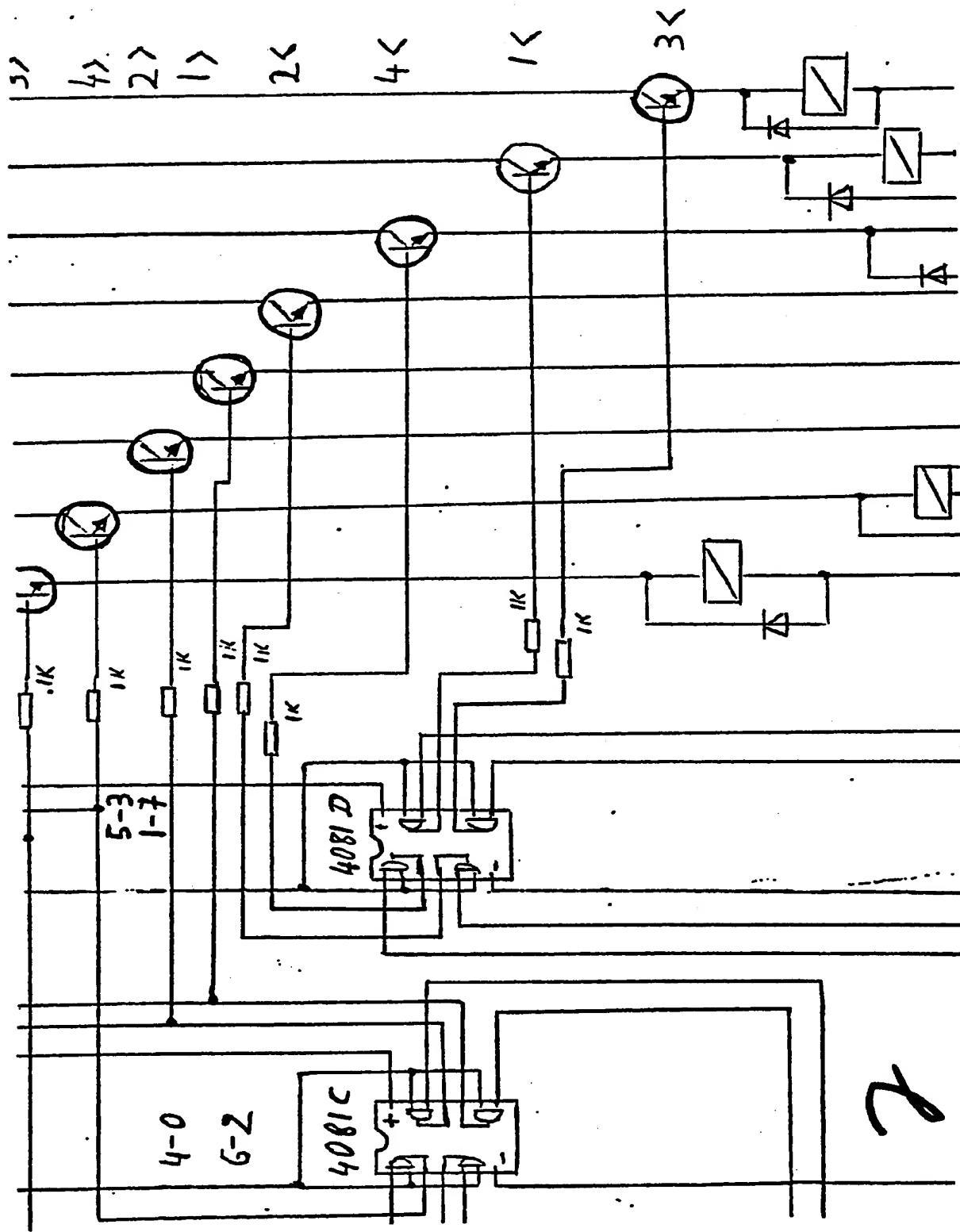
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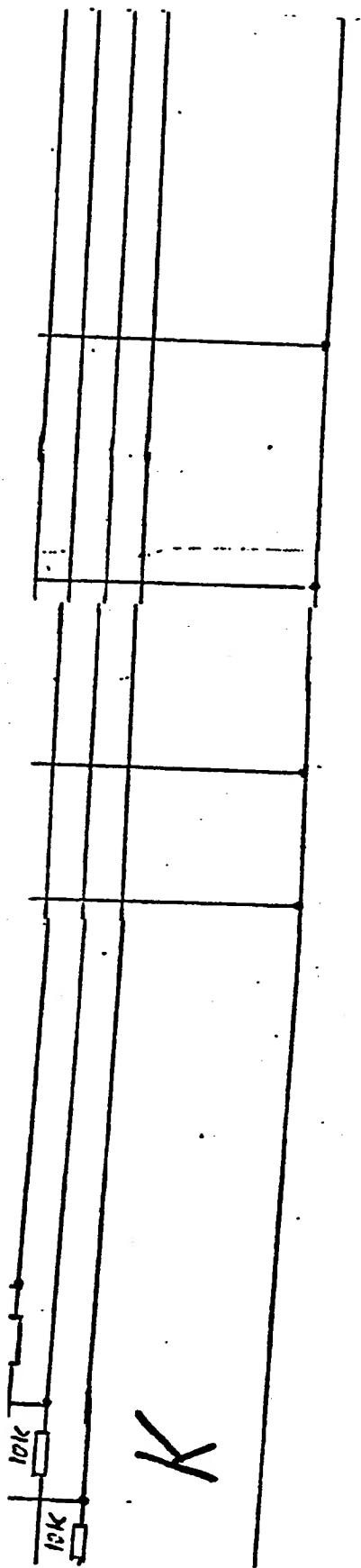
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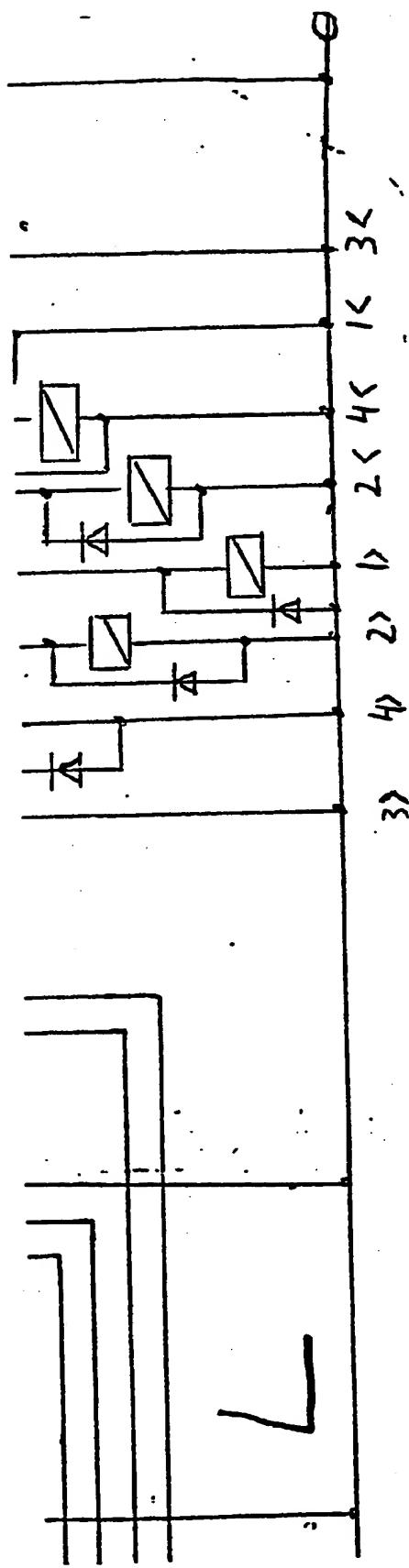
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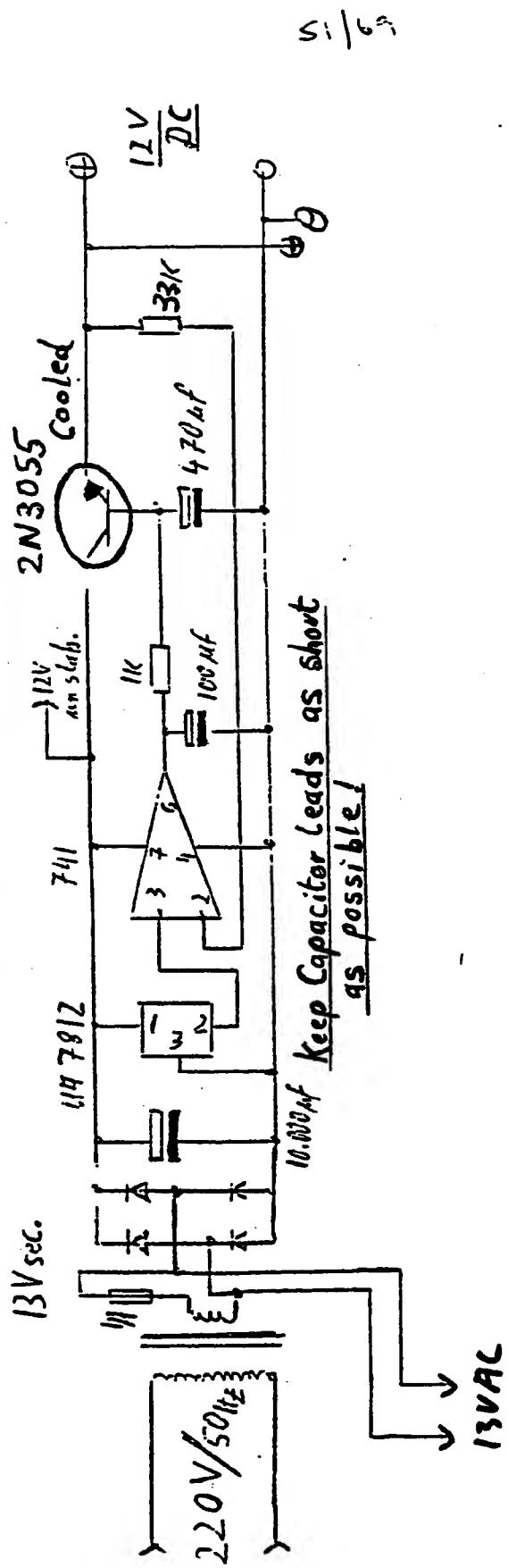
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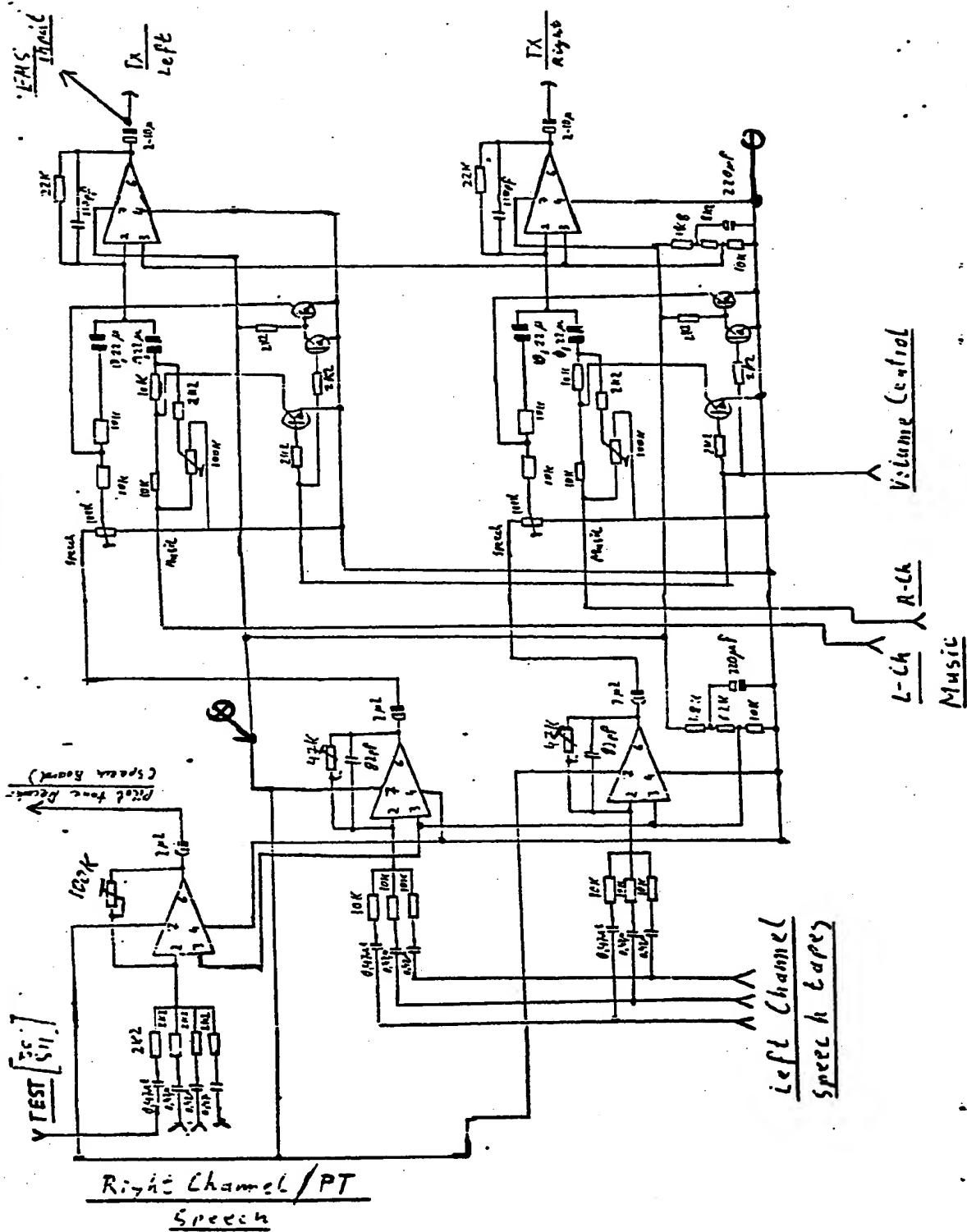
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## Power Supply



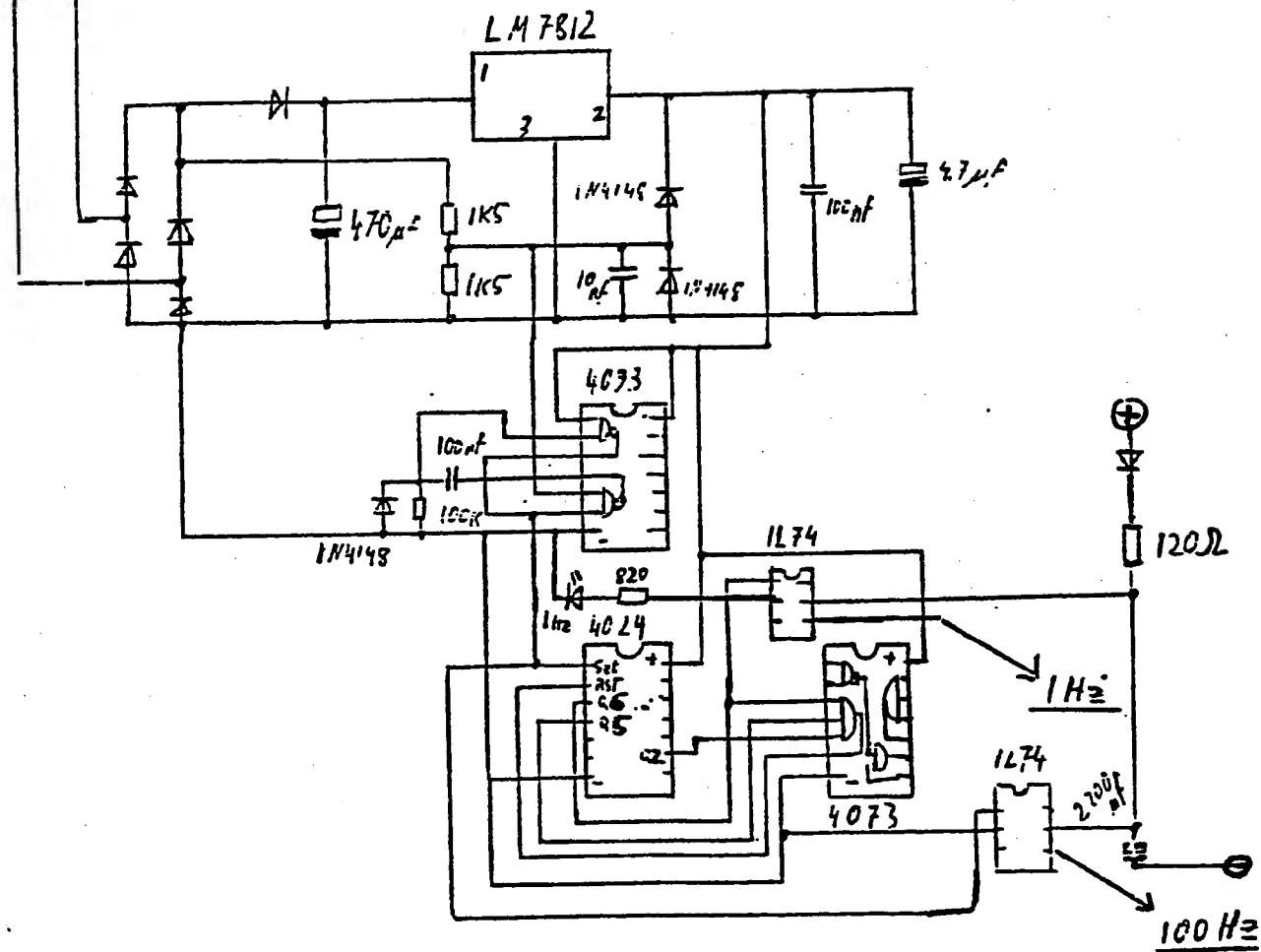
## Audio Matrix [Music Stereo/Speech Mono]



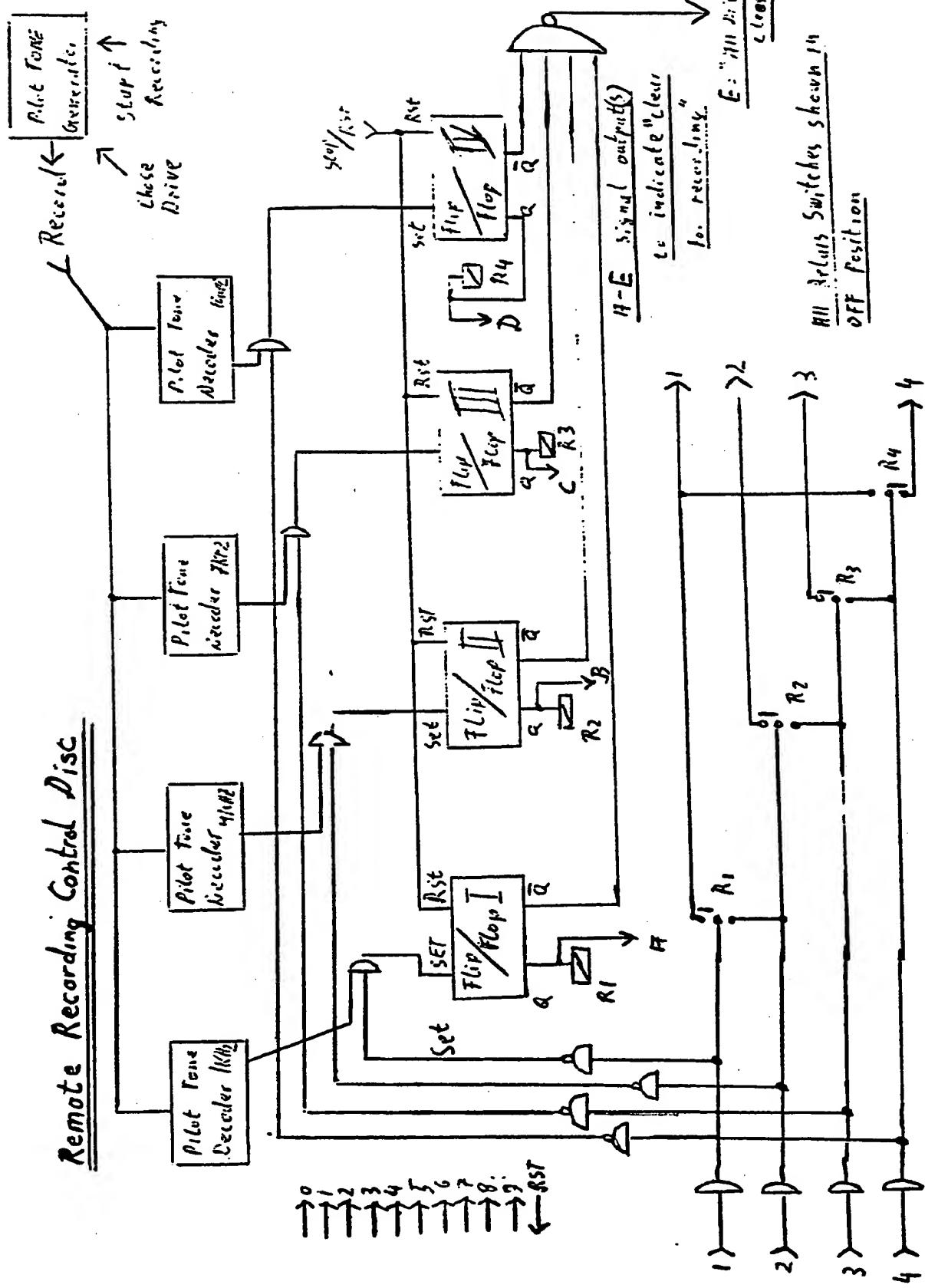
53 | 69

13V<sub>AC</sub>

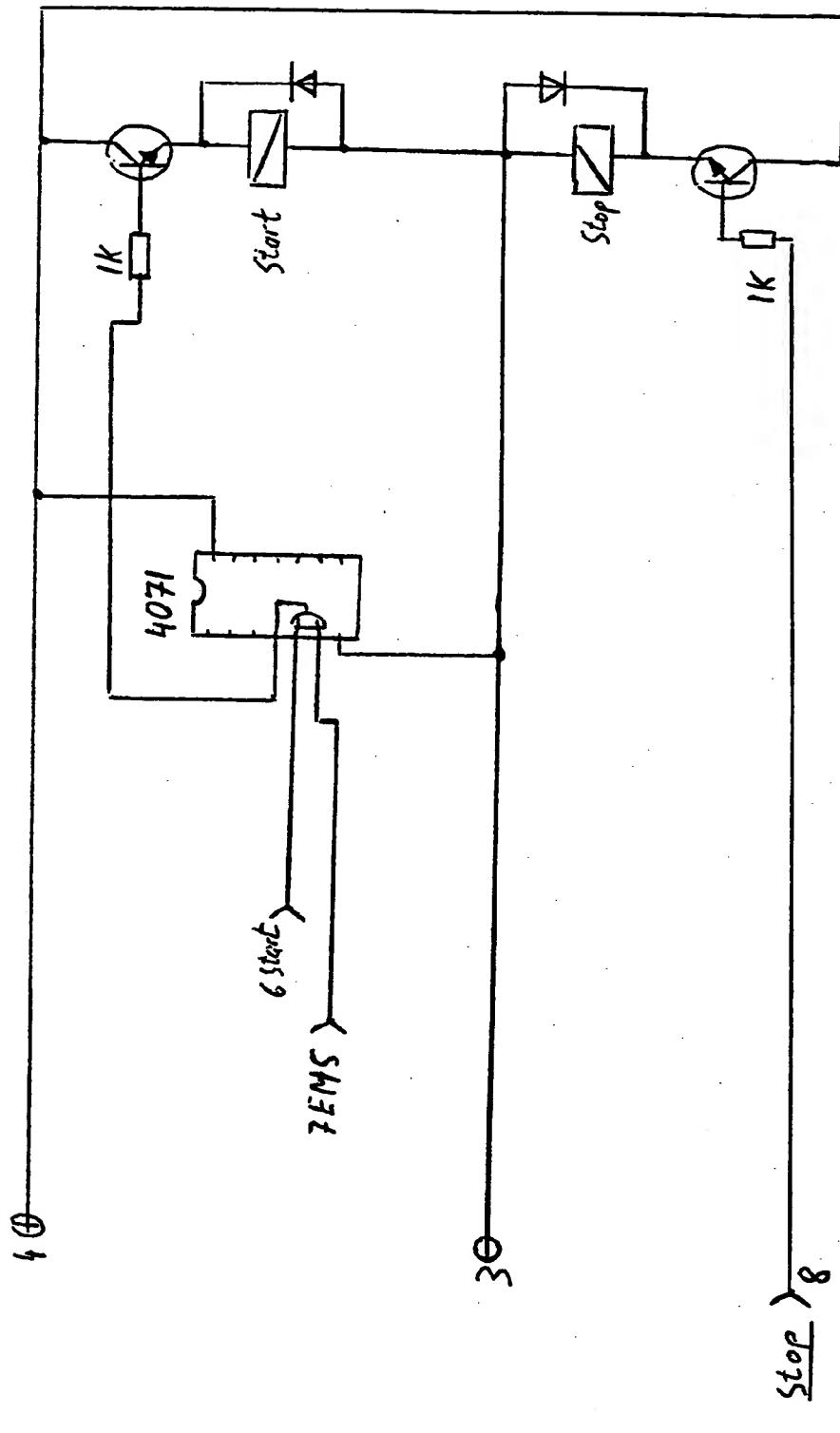
## Basis Time



## Remote Recording Control Disc



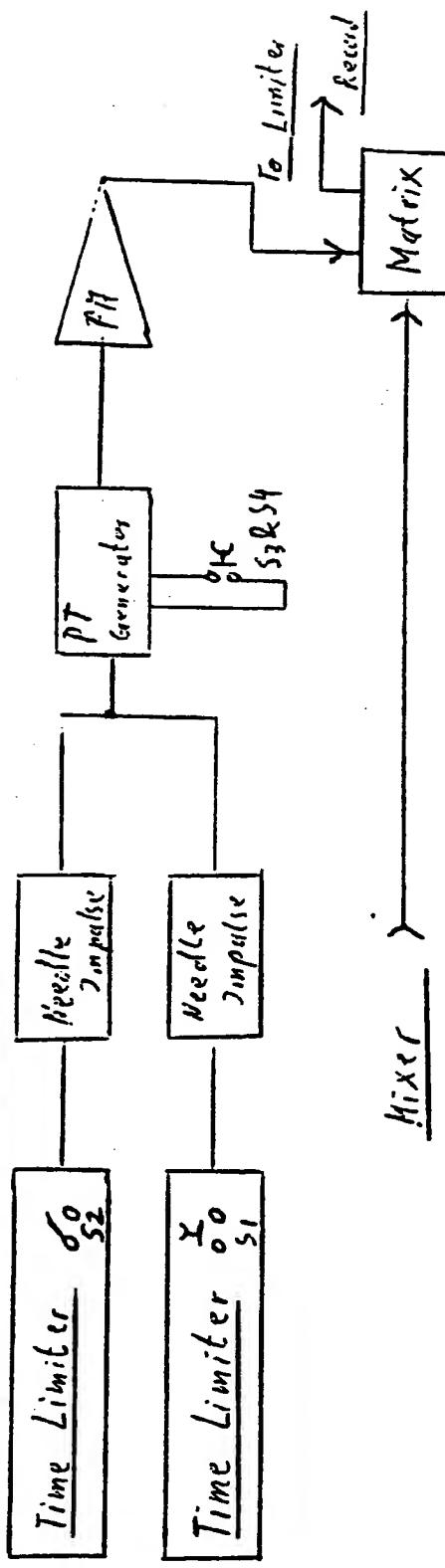
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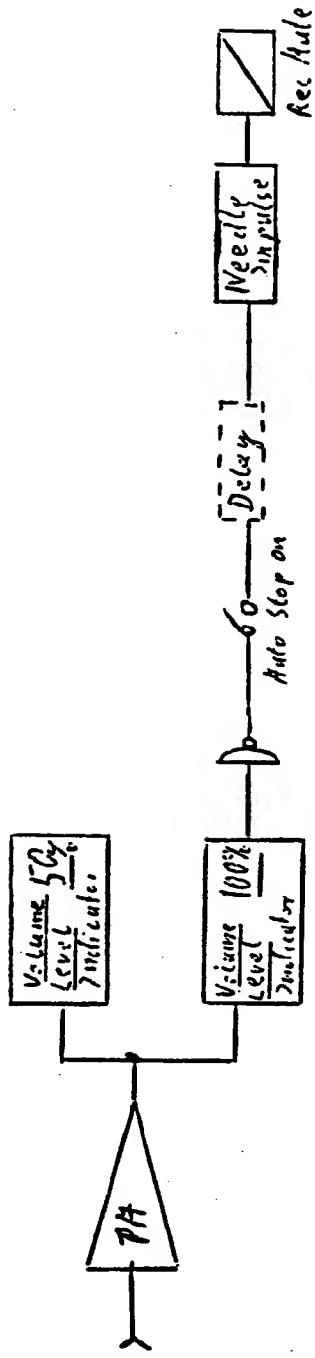
OTHER START/STOP Functions



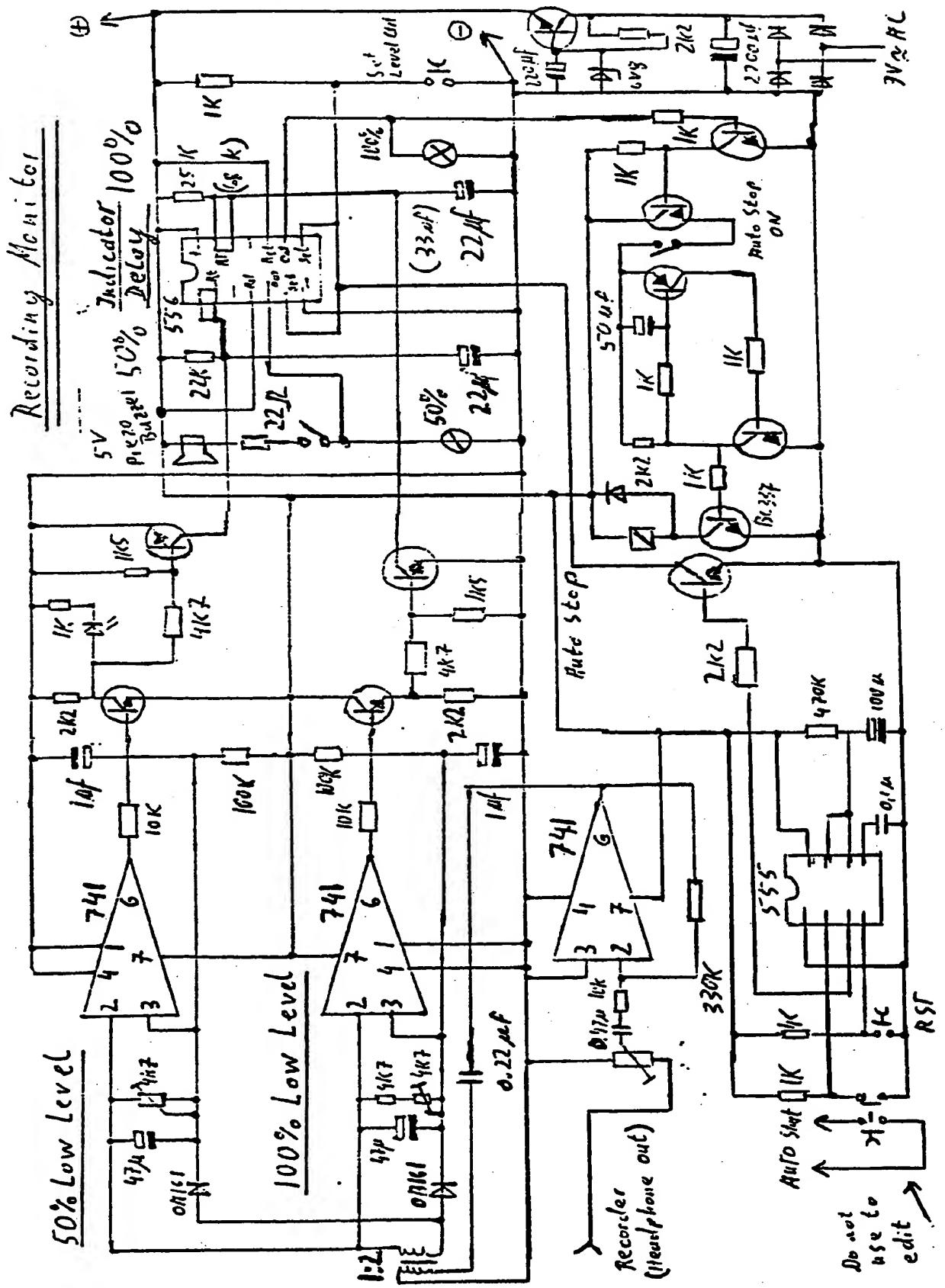
### Pilot Tone Generator



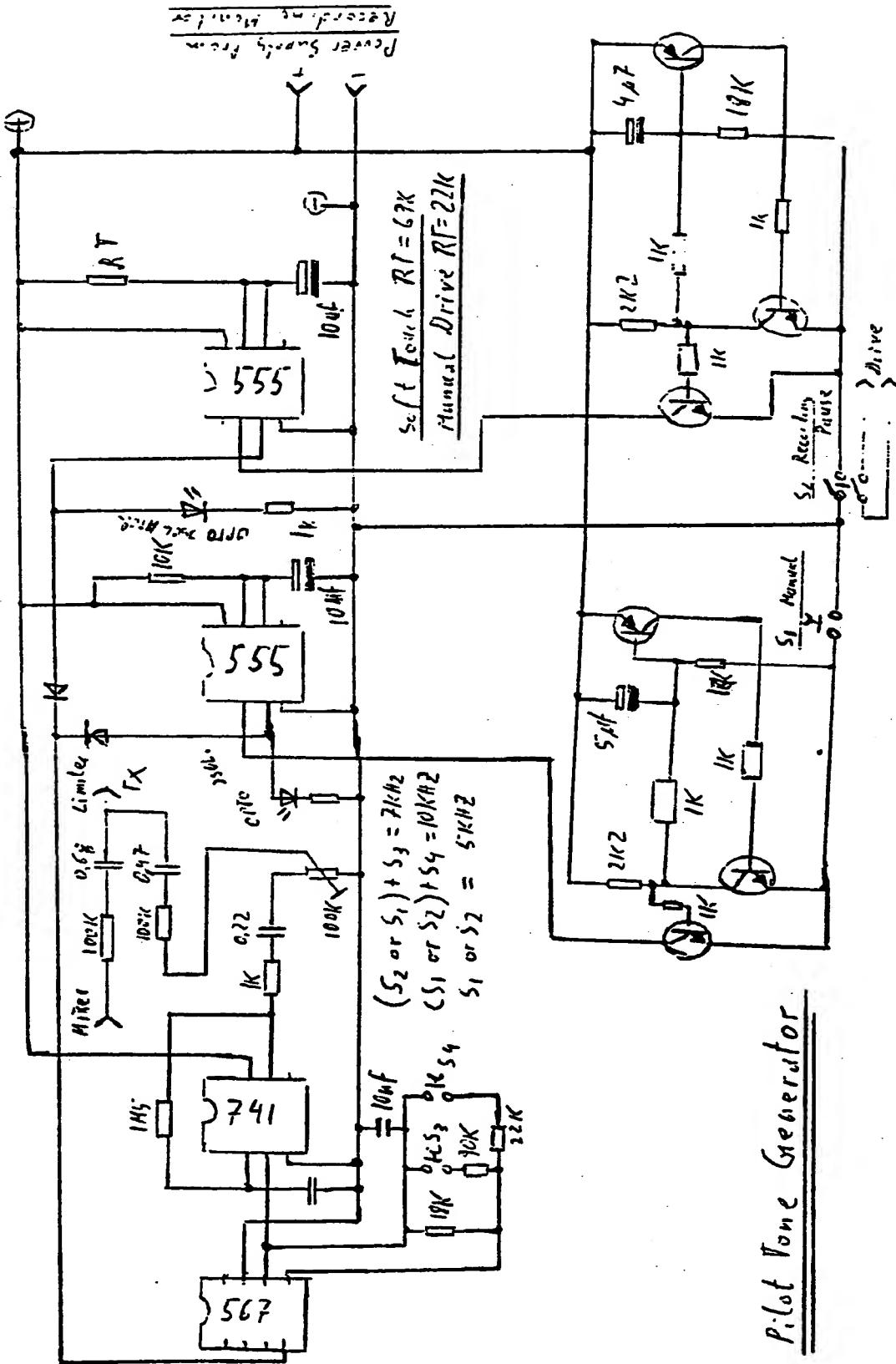
### Recording Monitor ① 8/89



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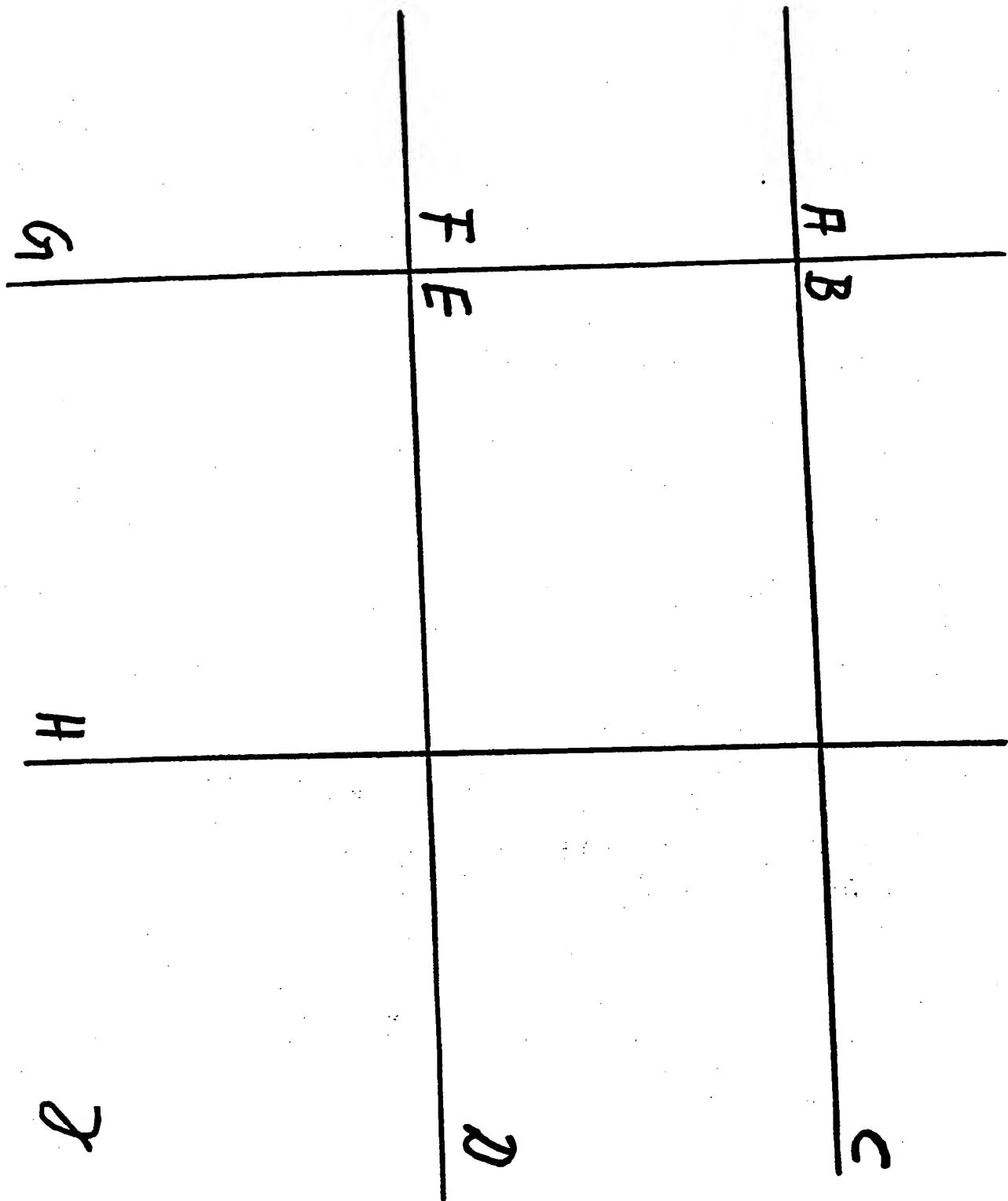


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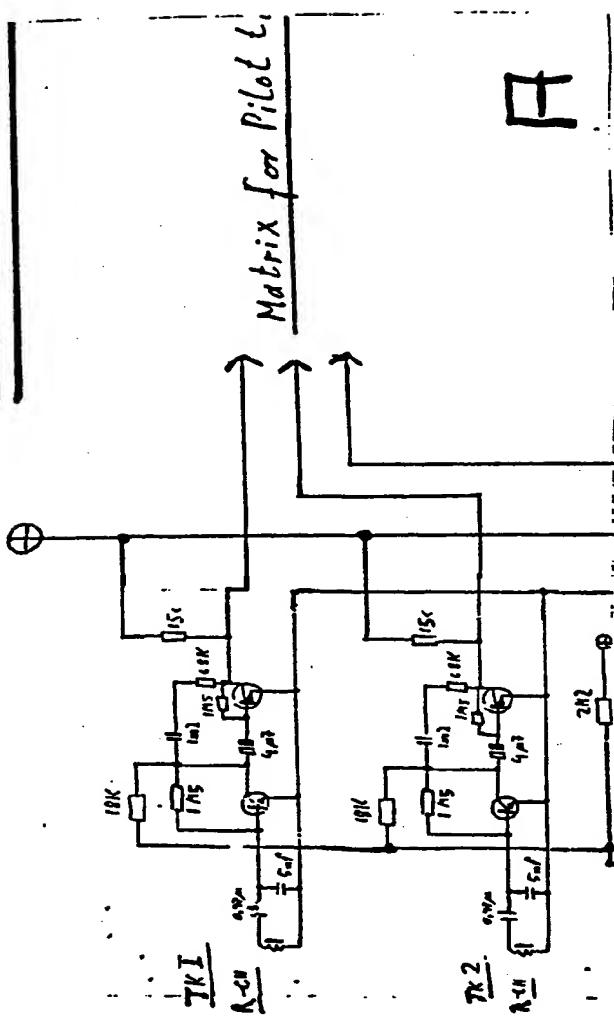
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Special Cassette Drive Connection

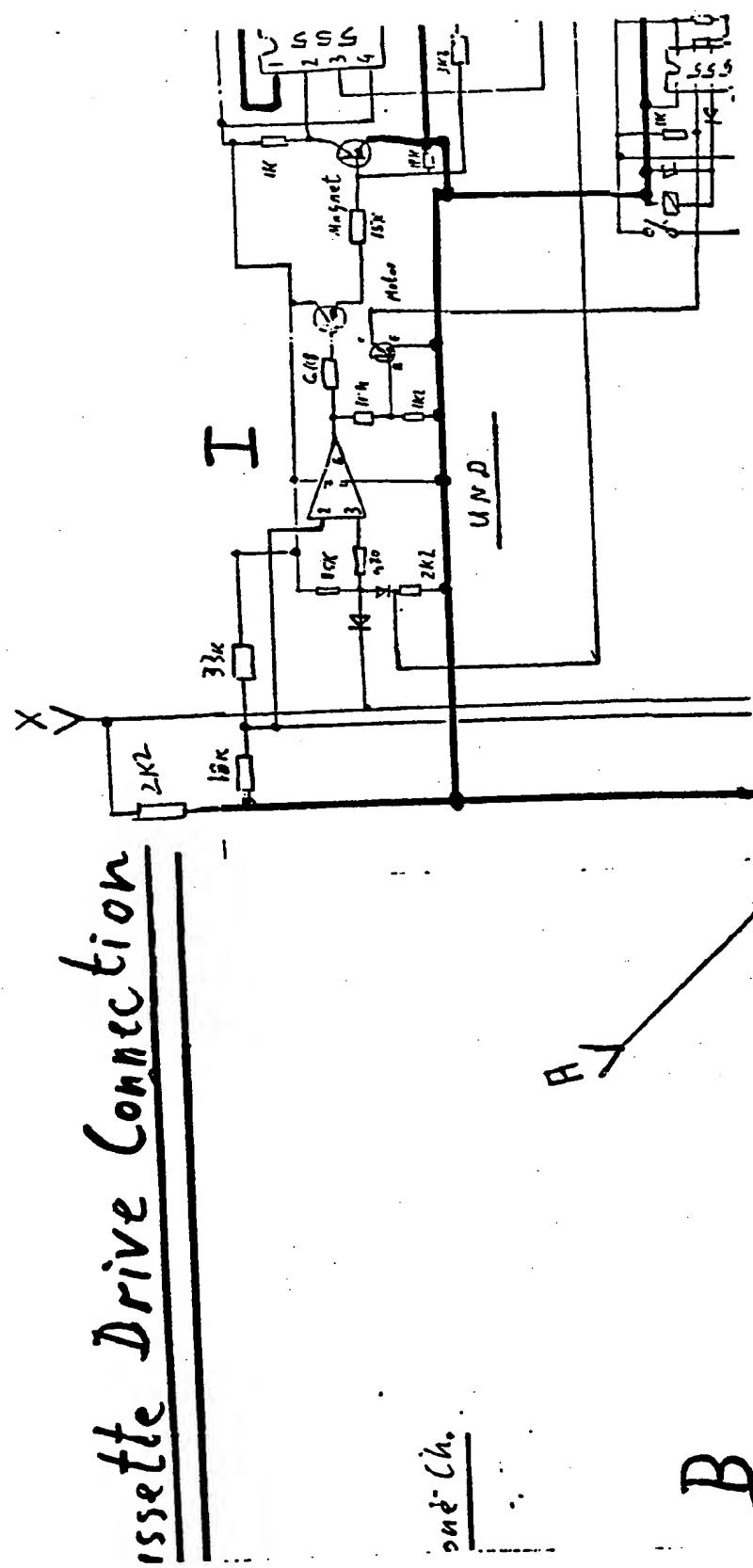


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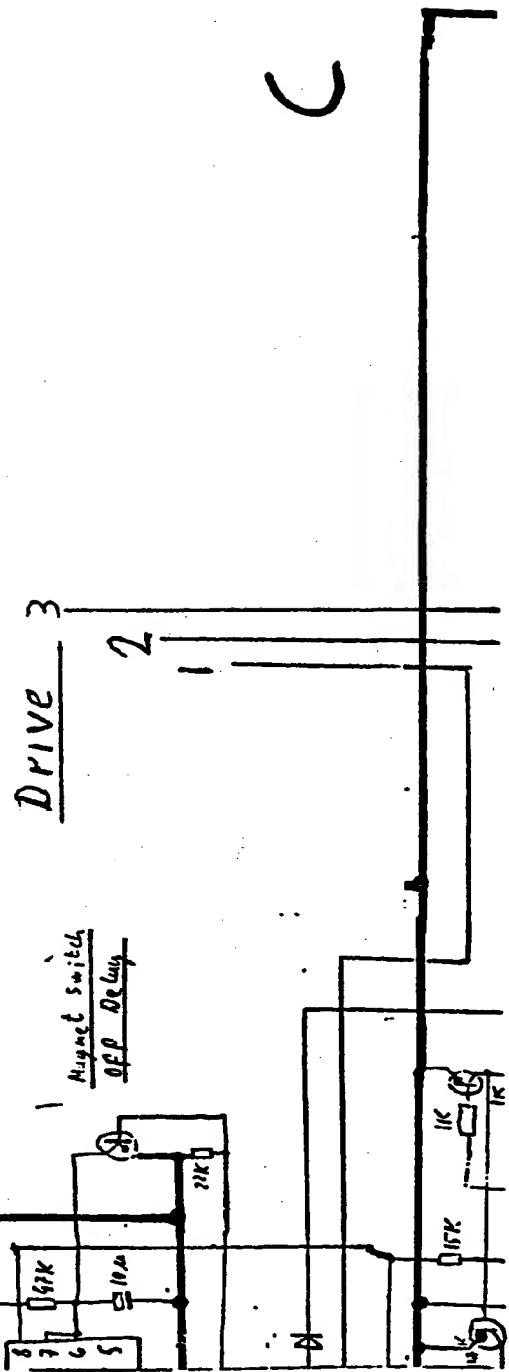
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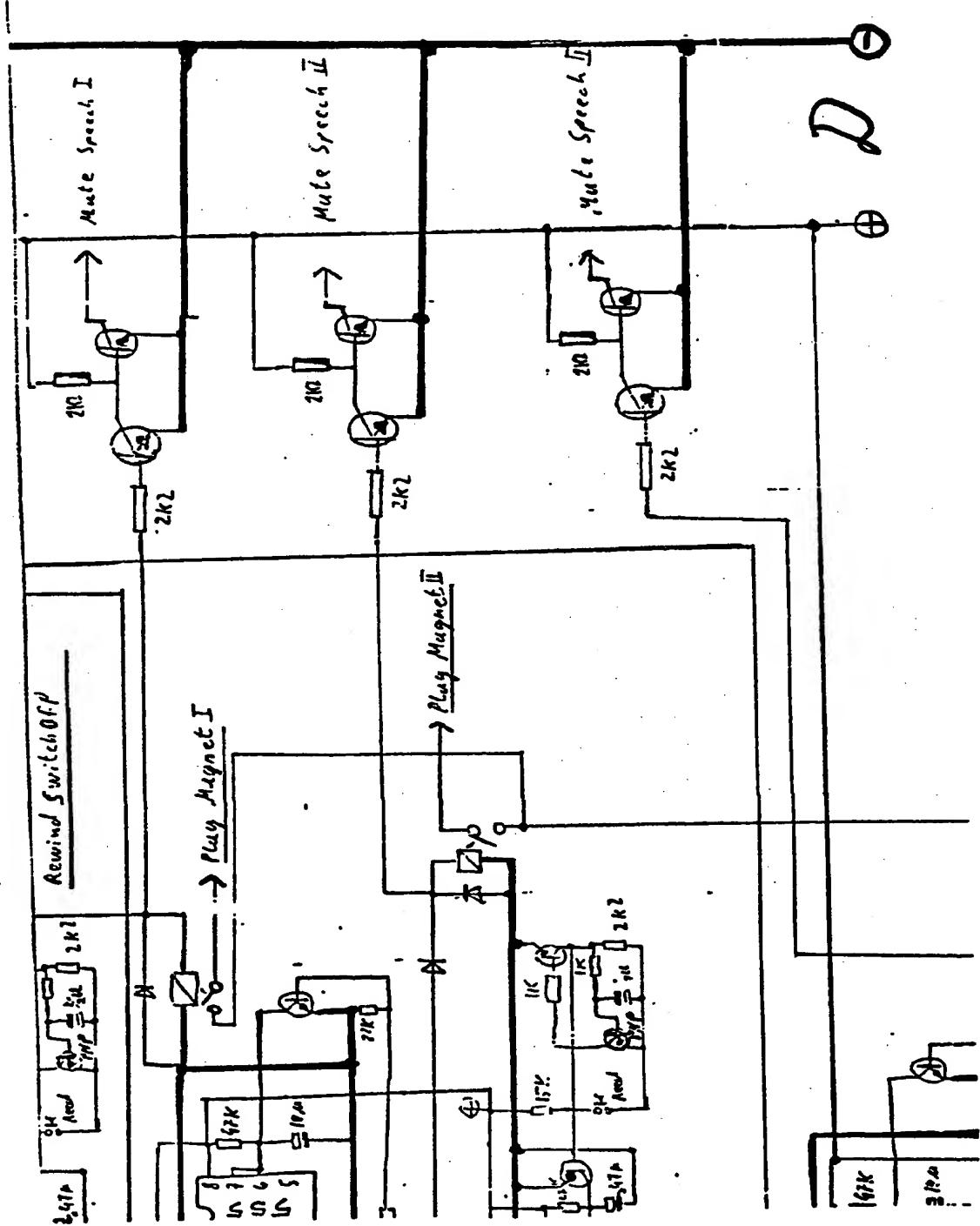
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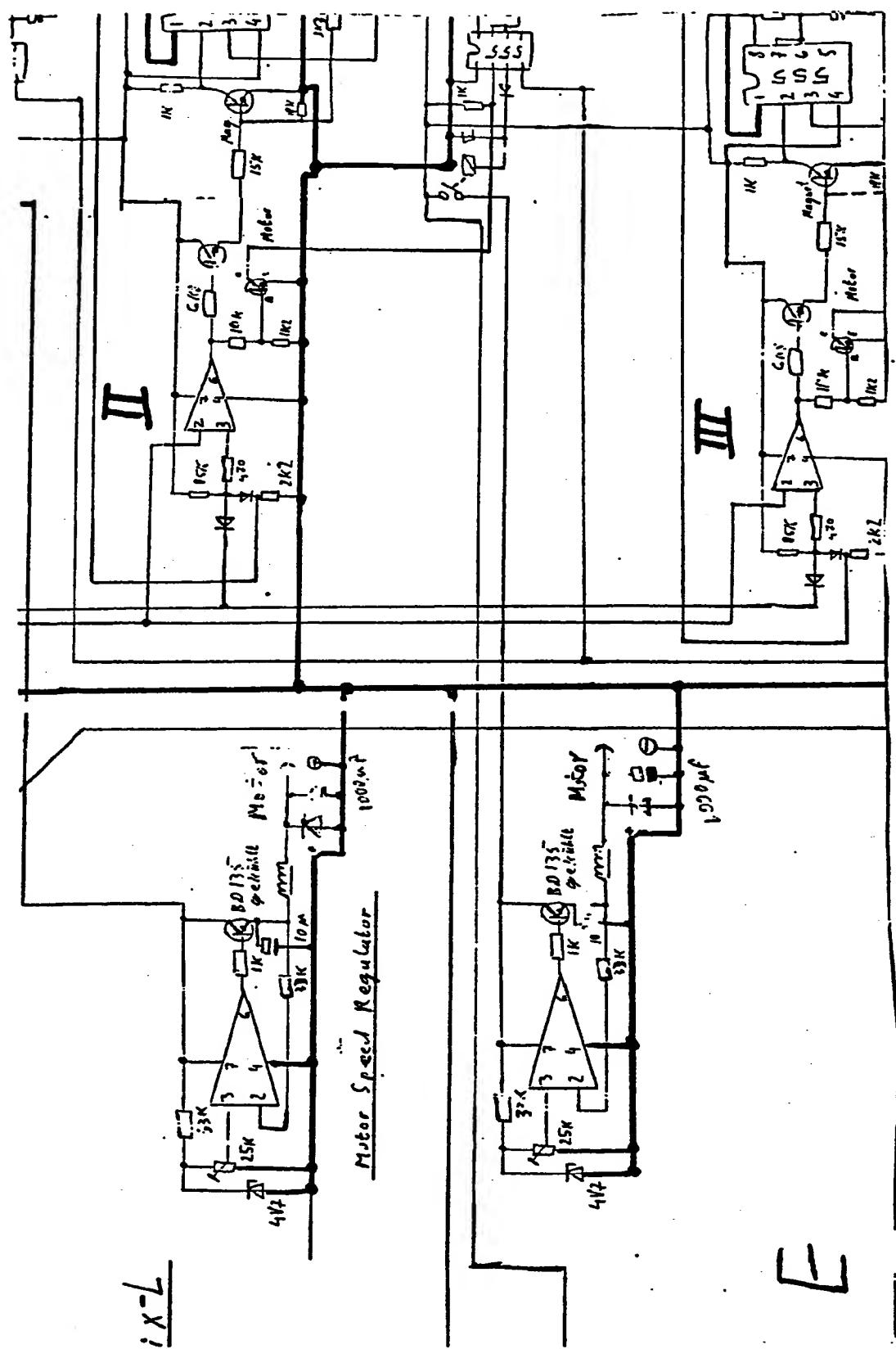
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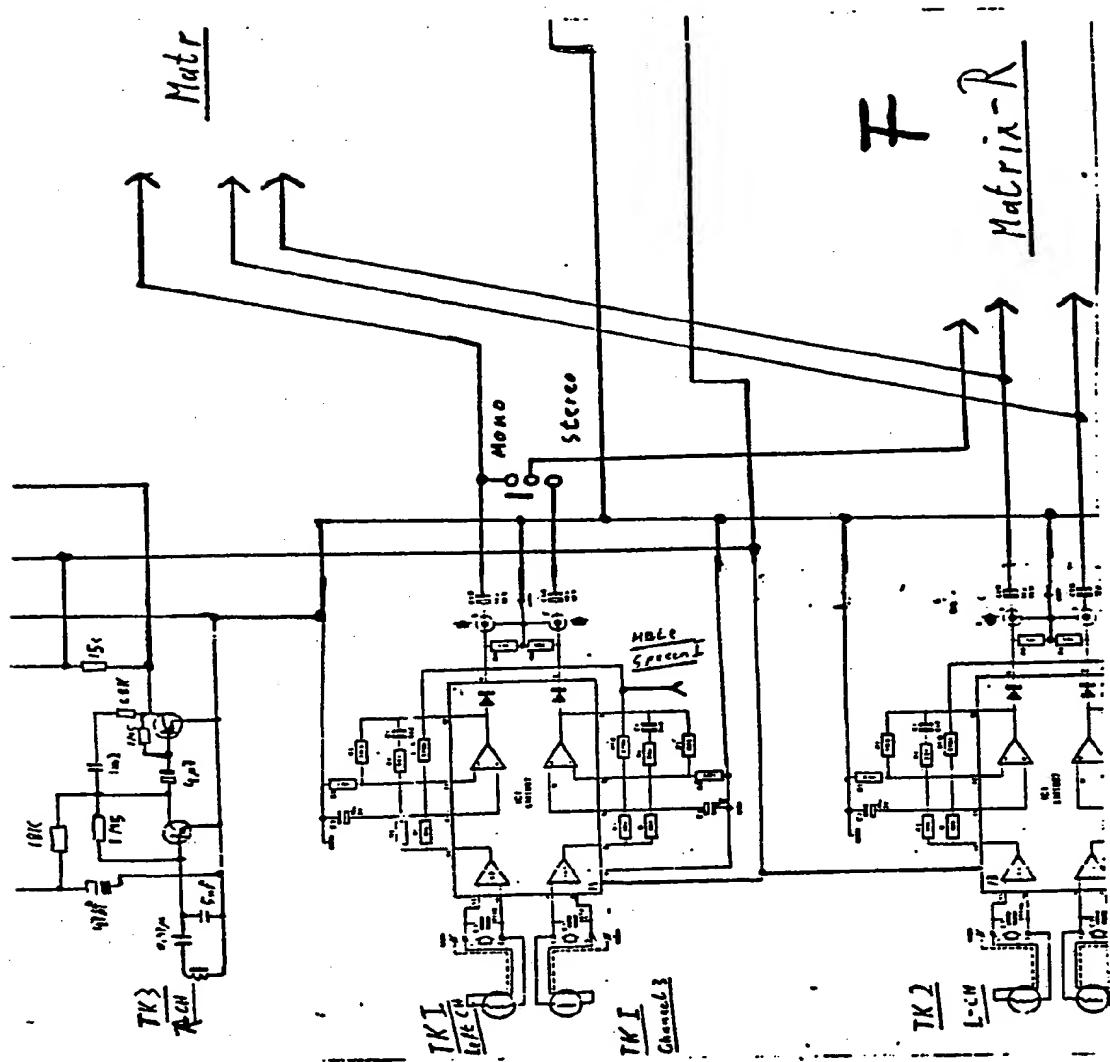
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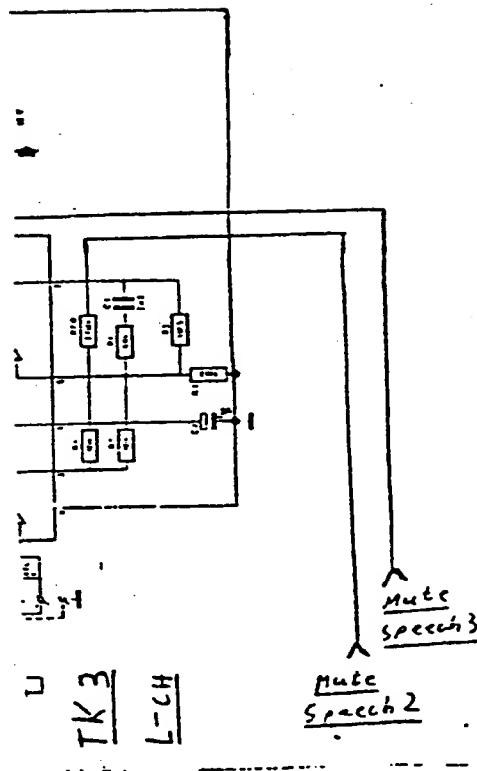


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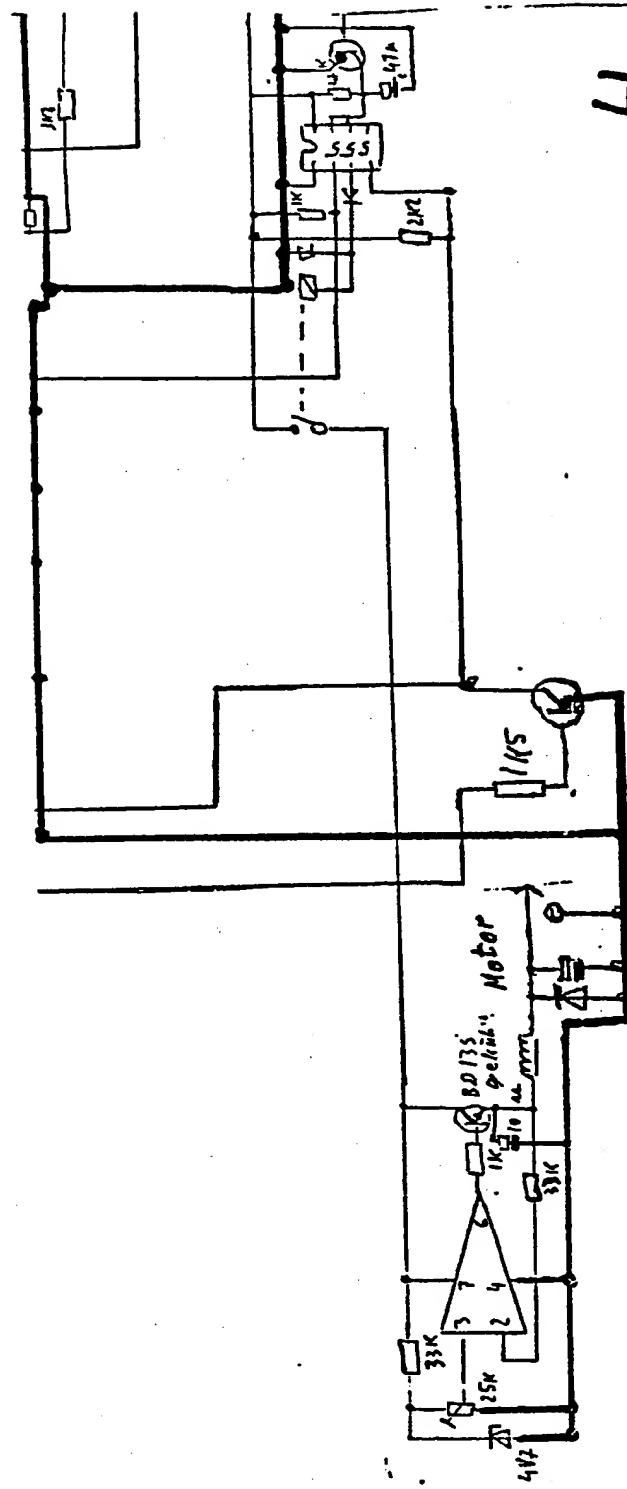
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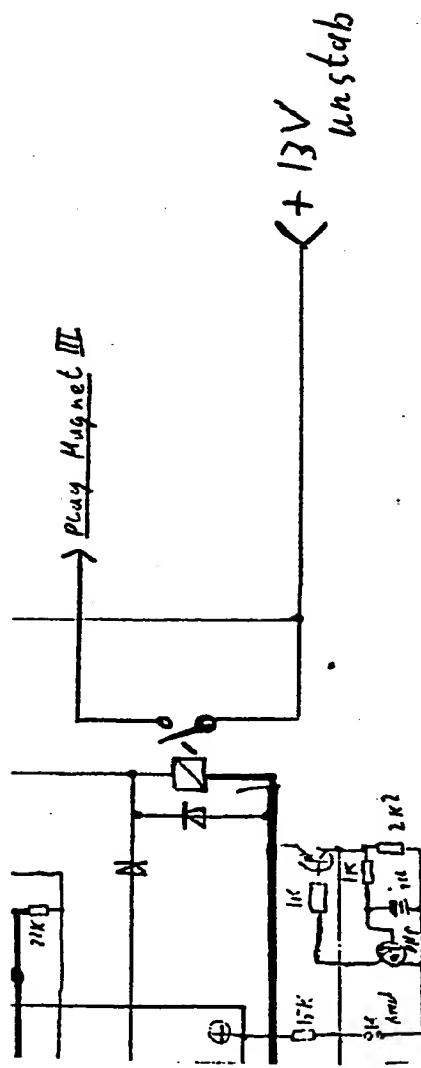
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## FULLY AUTOMATED RADIO DISC JOCKEY SYSTEM

This invention relates to a Fully Automated Radio Disc Jockey System.

A radio disc jockey selects and lines up a record then prepares for his next speech input. When the music comes to the fade out he switches the microphone on and makes his announcement. Shortly before ending he starts the next song and finishes the speech during the introduction of the current song. Again he has to select and prepare the next record.

During this procedure, however, he faces a considerable amount of spare time. Moreover the actual choice of music lies often with another person, the programme producer.

According to the present invention there is provided a Fully Automated Radio Disc Jockey System which mixes music with different speech items.

The music comes from one source, e.g. record, tape, compact disc, in a running sequence of several songs.

The other programme inputs (such as disc jockey announcements, commercial intervals, news) will be prerecorded, onto several tapes.

Accordingly the entertainment programme input (music) is separated from the information input (speech).

The Fully Automated Radio Disc Jockey System will mix the two programme parts in the following pattern:

While or after the music (music / entertainment source) starts to fade out, a speech tape switches on, meaning another programme source (speech / information) follows or is mixed over the outro of the music (e.g. an announcer speaks over the outro of a song).

Seconds after the actual end of the song (the music / entertainment input) the music / entertainment source will be stopped.

While or after the speech / information input comes to its end, the music / entertainment source switches on, meaning it follows or is mixed under the outro (fade out) of the speech / information (e.g. the announcer finishes his last sentence over the intro of the next song).

After the actual end of the speech / information input its tape drive will be stopped.

While or after the music (music / entertainment source) starts to fade out again, the process as described above will be repeated.

A specific embodiment of the invention will now be described by way of example, partly with reference to the accompanying diagrams.

The Fully Automated Radio Disc Jockey System consists of five main parts which are interconnected:

The Audio Matrix (audio mixer with preamplifier)  
 The Emergency Music Start Function (abbreviated EMS)  
 The Music Control Board (abbreviated MCB)  
 The Speech Control Board (abbreviated SCB)  
 The Music Play Back Counter (abbreviated MPC)

The MPC is an optional feature of the Fully Automated Radio Disc Jockey System.

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The Audio Matrix is an automatic audio mixer with preamplifiers. The music / entertainment signal coming from its source will be fed through a control at the Music Control Board and then diverted to the stereo music / entertainment input at the Audio Matrix. Furthermore the Audio Matrix has two separate inputs for track one and track two (right channel and left channel) for each tape machine connected to the speech / information input. The right speech channel carries five kilo hertz pilot tones to indicate several functions to the Speech Control Board. These will be described at a later stage.

The output of the right speech matrix will be supplied to the pilot tone decoder at the Speech Control Board. The left speech channel which carries the actual information input as a mono signal will be split and distributed to two matrices (stereo). One of the outputs of these matrices is sent to the left channel mixer the other to the right channel mixer (both in the same diagram). The purpose of these mixers is to mix the music / entertainment inputs with the speech / information inputs.

The mixer has a third input, named *Volume Control*. This input is controlled by the Speech Control Board. If the Volume Control input is low the speech / information input will be closed, and the music / entertainment input will be fully opened. If the Volume Control input is high, the speech / information input will be fully opened and the music / entertainment input will be reduced in volume. The level of reduction is variable and can be preset with a 100 k $\Omega$  potentiometer.

The mixer (TX) outputs deliver the full radio (lf) signal to the transmitter.

The Emergency Music Start Function is shown in the Music Control Board diagram. The Emergency Music Start Function is a pure back up control to reset the whole Fully Automated Radio Disc Jockey System, should a fault occur. Monitoring the left TX output, the Emergency Music Start Function will trigger off if it notices *blank air* (meaning no signal at all) for more than 17 seconds.

*Blank air* might appear e.g. if a tape drive was not loaded, pilot tones were forgotten to be recorded, tapes develop a mechanical fault or through a fault in the Fully Automated Radio Disc Jockey System itself, to mention just a few.

The main purpose of the Emergency Music Start Function is to restart the music / entertainment source; therefore the Emergency Music Start Function will give a start signal to the Music Start input of the Music Control Board.

If a Music Play Back Counter is connected to the Fully Automated Radio Disc Jockey System an Emergency Music Start Signal will also be sent to the Emergency Music Start Input at the Music Play Back Counter. This might reset / set the Music Play Back Counter depending upon the operational stage it is in. This will be described in the chapter about the Music Play Back Counter.

Should *blank air* occur as a result of a fault in the speech / information source the Emergency Music Start Function will stop and rewind the relevant tape.

The Emergency Music Start Function can be switched off with switch S15 (e.g. for test purposes).

### Technical description of the Emergency Music Start Function

The Emergency Music Start Function works basically on the same principles as the Volume Level Indicators which will be described later.

The incoming signal is regulated by a potentiometer (pre set), then put through a rectifying amplifier, a conventional OP (e.g. LM 741) with the non inverting input connected to ground (minus pole).

This signal will be sent to the prime input of a 1:2 transformer. The transformer output will be rectified with a diode (e.g. OA 161 or OA 81). This signal will be directly distributed to the non inverting input of another OP (LM 741), the other transformer output is connected with the inverting OP input.

Parallel to the OP inputs is a capacitor ( $47 \mu F$ ) and the signal can be regulated by a variable resistor parallel to the capacitor. The non inverting input of the OP is also connected with a  $100 k\Omega$  resistor to Ucc (plus pole) and a  $1 \mu F$  capacitor to ground (minus pole). The offset / control voltage input of this OP (Pin 1) will also be connected to ground.

The OP output will be delivered to two transistors which convert this positive signal to a negative potential at the RC-combination of the following timer, providing the Emergency Music Start Function input has a sufficiently loud signal. Should the signal strength fall below the preset level, the RC-combination at the timer will start to load up. If the signal strength fails to improve within the RC-combination's charge up time, which is less than one second, the timer output will fall from a positive to a negative potential.

At the Volume Level Indicators these timers are in one NE556 Integrated Circuit. The outputs are feeding conventional inverters which distribute the relevant signals. The two timers are set / started by the Music Start impulse coming from the Speech Control Board.

At the Emergency Music Start Function the timer is a NE 555 Integrated Circuit which is self resetting. A further NE 555 timer follows because the time between the impulse and the reset is too short to trigger a relay. The second timer's only purpose is to give a sufficiently long trigger impulse, inverted to the first NE 555 output.

The output of the second timer goes to switch S15 and from there to the Music Play Back Counter to the Speech Control Board through a diode to the Music Start input of the Music Control Board and to relay R3; this is for external connection.

Relay R3 might load compact disc players or tape machines which need a preprogrammed running order (like the Sony MTL 10 Cassette Player). For this purpose one can connect a *Five Cassette Loader* which triggers five or two (depending on its switch setting) different switches at the relevant machine, one after another with a pause in between, if it receives one Emergency Music Start trigger.

Relay R3 might also trigger alarm systems to alert radio station staff of the occurrence of faults during the programme.

The main purpose of the Music Control Board is to monitor the music / entertainment source. There are three different possibilities (modes) to monitor the song.

It can be done either

through monitoring the volume level of the right channel (The function of the Volume Level Indicators was described in the paragraph about the Emergency Music Start Function) ;

or by an external controller (eg.a computer with a programmed database of the song order and duration in connection with a timer) ;

or by pilot tones on the right channel of the source while the left channel carries a mono signal (In the pilot tone operation mode one would require a three track source for stereo operation because one track is needed for the pilot tones.)

The monitor will signal twice

Once at the 50 % Volume Stage ,which indicates the ending of the song or music / entertainment input .

Once at the 100 % Reduced Volume Stage,which indicates the actual end of a song.

These stages are shown by two *Invert Signals* LED's in the Music Control Board Diagram (not shown on block diagram).

These stages are either

automatically set by the Volume Level Indicators

or by the external controller

or set by the prerecorded pilot tones on the source,according to the mode in which the monitor is programmed .

This can be done by altering the switches S9 and S10 which are shown to be set in the Volume Level Indicator Control mode .

The timing for the actual command to indicate the 50 % Volume Stage is variable and might be during or after the outro of a song . It relates to the sensitivity setting of the 50 % Volume Level Indicator , the pilot tones or the external commands. The 50 % Volume Stage gives a Start Speech Signal to the Speech Control Board,meaning it starts a speech / information tape, as well as giving a set / count signal to the Music Play Back Counter .

#### The 100 % Volume Stage

switches the link off to the Audio Matrix from the right channel of the music / entertainment source

and switches the link off to the Audio Matrix from the left channel of the music / entertainment source if switch S8 is set accordingly

and switches the link off to the Audio Matrix from the whole music / entertainment source if switch S8 is set accordingly and switches S9 and S10 are in pilot tone operation mode (two track recorded source)

and leads the right channel of the music / entertainment source to the pilot tone decoder

and triggers an opto isolator for external signaling

and starts the timerfacility with CD4017 C which stops the source after 3 or 4 seconds according to the setting of switch S14 (*stop break*).

The source may not be stopped if its start / stop function is controlled by relay R2. In this case the Pilot Tone Controlled Cassette Change Function with CD4017 B might override the switch off command. This Function is designed for sources with long switch over times, eg from cassette one to cassette two or side A to side B (a typical machine of this kind would be the Sony 10 Cassette Changer MTL 10). During the 100 % Volume Stage the right channel of the music / entertainment source is lead to the pilot tone decoder. If it receives a 5 khz pilot tone before the timer facility with CD4017 C stops the source this function will override the timer. Relay R2 will then stop the source as soon as the Pilot Tone Controlled Cassette Change Function receives a second 5 khz tone from the right channel of the source unless a Start Music signal was received before from the Speech Control Board.

The Pilot Tone Controlled Cassette Change Function with CD4017 B does not work in the pilot tone operation mode, set by switch S9 and S10. The pilot tones on tapes for sources with long switch over times can be recorded accordingly by omitting the pilot tone for the 100 % Volume stage at the end of the last song on the relevant side / tape. Instead it will be recorded at the beginning of the next side / tape exactly four seconds before the first song starts. (For sources with fast switch over times, such as the operation with the Music Play Back Counter, this pilot tone will be recorded at the end of the last song.)

The pilot tone decoder is protected by a delay which prevents it from receiving more than one impulse within approx. three seconds.

A further input of the Music Control Board is the *Music Start* connection which receives its signal from the Speech Control Board.

Such a signal will

give a start signal to the Music Play Back Counter  
and set (start) the Volume Level Indicators

It will also start a timer. For a duration of 80 seconds it overrides the level indicators and prevents it from giving the start speech signal and from stopping the music / entertainment source.

(This 80 seconds timer primarily protects the 50 % Volume Level Indicator from giving false signals during a song's intro. It can be switched off for test purposes or during pilot tone controlled mode with switch S13.)

furthermore this timer will reset the counters CD4017 A ; CD4017 B ; CD4017 C and keep them in that position for 80 seconds.

The *Music Start* signal will also trigger relay R2 provided the *Security Music Start* function with LDR 1 indicates that the music / entertainment source is in stop position.

The *Security Music Start* function is a safe guard to prevent relay R2 making a *Start* trigger while the connected drive is in operation, because such an additional *Start* signal would in fact be regarded as a *Stop* signal by the relevant play back source.

The *Security Music Start* function requires an opto isolator with its LED connected to the motor (or any other *Play back on* indicator) at the source, which is controlled by relay R2

Other Special Functions :

Switch S11 cuts the pilot tone decoder off and connects it with a test input .

A high signal during Volume Level Indicator Control mode through Switch S12 overrides the 50 % level indicator and prevents it from giving the *start speech signal*. This function is useful when the music / entertainment source carries a prepackaged programme which does not require further speech / information inputs.

The input of switch S12 requires an opto isolator with its LED connected to a *play back on* indicator at the source, which plays the prepackaged programme. It should be connected in a way that the LED switches and stays off as soon as the prepackaged programme ends . This will let the Fully Automated Radio Disc Jockey System resume automated programming .

The music / entertainment input can be played from various sources, provided these sources have electro-mechanically switched drives . The music / entertainment input is not limited to tape machines but can be connected to any signal source such as Compact Disc Players, Record Players, Radio Receivers to mention just a few.

Music / entertainment sources can either be controlled by relay R2 on the Music Control Board or by the Start / Stop Control as shown in the *Other Start / Stop Functions Diagram*, or by the Music Play Back Counter .

Relay R4 gives both , the start and the stop commands . This can be used for one button only controlled Play Back sources . This option requires the use of the *Security Music Start* function to prevent *Start* commands to stop the drive.

The *Other Start / Stop Functions* set up will be connected to the Music Control Board outputs which were designed to feed the Music Play Back Counter . The *Other Start / Stop Functions* set up has two relays to send a seperate Start and Stop impulse to the music / entertainment source.

These two options have two great disadvantages . The relays control only one play back machine. This limits the capacity of programme length or requires special multi tape machines or expensive juke box alike Compact Disc or Record Players. The second disadvantage is that tapes, if used, have to be recorded right up to the very end to avoid *blank air space*. Lastly it is possible that certain tape or record changers need special impulses or commands , like those described in the paragraph about the *Pilot Tone Controlled Cassette Change Function*. Naturally an increased use of special commands reduce the reliability of a complex machine such as the Fully Automated Radio Disc Jockey System .

The Music Play Back Counter was invented to increase the reliability of the Fully Automated Radio Disc Jockey System, to simplify the music / entertainment recording process and to increase the capacity of the whole Fully Automated Radio Disc Jockey System .

Basically designed to run two or four (to be choosen by switch S19) auto reverse cassette drives, the Music Play Back Counter can also be used with two or four single direction drives but this does obviously decrease the capacity by half. To do so the switches S20 - S23 have to be set to *single direction play back* . The operation discription will be the same as for auto reverse drives in single direction mode .

If the Counter CD4017C and its following controls leading to the *Start, Stop and Reverse* relays are expanded the Music Play Back Counter can be used with any amount of single or reverse direction drives, as long as their quantity is higher than two.

The music / entertainment tape machines used in conjunction with the Music Play Back Counter can be either Reel To Reel or Cassette drives . In either case they should be equipped with electro-mechanically operated Start , Stop and Rewind functions (so called soft touch button operation ). The function switches of those drives have to be replaced by the contacts of the relevant relay in the Music Play Back Counter . Reverse machines should have separate Start buttons for each direction . (A recommended auto reverse cassette recorder with these functions would be the Technics RS-TR 355)

The Idea of the Music Play Back Counter is to play a certain amount of songs on each side of a tape . The counter as shown in the diagram is set to play eight songs (on industrial recorded tapes) , 15 songs (on C90 cassettes) or 19 songs (on C120 cassettes) . The setting can be programmed for three different steps (with switches S16 and S17 ) between two and 99 songs ; or even from 2 - ∞ songs if the the capacity or the combination of counter CD4017A and counter CD4017B will be expanded . The following discription will always relate to a setting of 19 songs , which is nevertheless the most economical and realistic setting for cassette drives .

The programme sequence resembles the following example:

Song 1 - speech / information , song 2 - speech / information , song 3 - speech / information ... song 19 - speech / information ; song 1 side two ... (flip side) - speech / information , song 2 side two - speech / information ..... song 19 side two - speech / information ; song 1 cassette two side 1 - speech / information ..... and so on

Simply , what this example shows is that after song 19 plus the 3 or 4 seconds stop break the playing order will change to the next or the reverse drive . Tapes do not have to be filled right to the end , because the flip side will start exactly where the last song of the previous side ended .

After playing 19 songs of the reverse side this drive will rewind the tape to the beginning of side one and another drive will be started with the next Start Music Play Back Counter Signal .

While recording music tapes , there are two items to watch : to count the exact amount of songs and to watch that the songs on the flip side are marginally shorter than on the first side (tape length Side 2 < Side 1 ) .

The set / song-count impulse is given by the 50 % Volume Stage as indicated by the Music Control Board . This makes sure that the Music Play Back Counter counts even if the tape drive does not stop , e.g. if the announcement is shorter than the fade out plus the four seconds stop break .

Please note that the Music Play Back Counter actually counts the music / entertainment inputs rather than the songs as such . This means if two songs are faded into another , there is no speech / information input between the two songs , the counter will assume that only one song was played .

If the Music Control Board is in Volume Level Indicator Mode it is possible to play almost all commercially recorded tapes on the music / entertainment cassette recorders which are controlled by the Music Play Back Counter . Commercially recorded tapes do not restart side 2 exactly after the end of the last song on side 1 . Therefore they can only be played on one side . The switches S20 - S23 will enable the four drives individually to be switched into Single Side mode . As soon as the last song on side 1 in this drive finishes the Single Side mode will rewind the tape to the beginning of side one and

another drive will be started with the next *Start Music Play Back Counter Signal* .

The *Count Number* cannot be set individually for each drive. Therefore the lowest song count of all two or four tapes should be selected. The counter will skip songs which follow after the highest setting . Accordingly it will restart the reverse side after the set song.

As an example : The counter setting is 15 but there are 19 songs on the tape the Music Play Back Counter will skip the songs 16 - 19 . So side 2 of that tape will be started after song 15 on the first side. If this tape was recorded for a counter 19 setting side 2 will now probably start in the middle of its third or fourth song . It is then also advisable to switch off this drive's reverse function .

Tapes can be changed while transmission is in progress . This should be done while the music drives are in stop position during a speech / information input . New tapes should be rewound to the beginning of side 1 . After the change the counter must be reset to zero with switch S18 .

Careful consideration was given to the design of the Music Play Back Counter's Emergency Music Start Functions .

If the Music Play Back Counter receives an Emergency Music Start signal it will firstly check if a music / entertainment drive is in operation . If not ,the reason for a blank TX signal must be suspected to come from a speech / information drive . This will then be rewound ,as discribed before ,and the Music Play Back Counter will start the next lined up song without taking further action .

If the Music Play Back Counter receives an Emergency Music Start signal and a music / entertainment drive is in operation it will start the next music / entertainment machine and rewind side 1 of the tape which caused the fault .

The actual "heart" of the Fully Automated Radio Disc Jockey System is the Speech Control Board .

The speech / information tape machines used in conjunction with the Speech Control Board can be either Reel To Reel or Cassette drives . In either case they should be equipped with electro-mechanicaly operated Start , Stop and Rewind functions (so called soft touch button operation ) . The function switches of those drives have to be replaced by the contacts of the relevant relay in the Fully Automated Radio Disc Jockey System.

(A recommended cassette recorder with these functions would be the Technics RS-TR 355)

The running order of the speech / information tape machines is set by Counter CD 4017 I . The counter outputs Q 0 - Q 9 are connected to a 15 Pin distributor socket . Further connections are the socket outputs 1 & 2 & 3 & 4 for the tape drives and the Reset (RST) Pin which is wired up to the reset input of counter CD 4017 I . The plug inserted into this socket will operate as a programme disc . Every counter output will be assigned to a tape drive to programme the running order , for example :

**Tape Order**

1 2 3 4 1 ...

Q0 = 1  
 Q1 = 2  
 Q2 = 3  
 Q3 = 4  
 Q4 = RST  
 Q5 = not connected  
 Q6 = not connected  
 Q7 = not connected  
 Q8 = not connected  
 Q9 = not connected

**Tape Order**

1 1 2 2 3 4 1 1 ...

Q0 = 1  
 Q1 = 1  
 Q2 = 2  
 Q3 = 2  
 Q4 = 3  
 Q5 = 4  
 Q6 = RST  
 Q7 = not connected  
 Q8 = not connected  
 Q9 = not connected

**Tape Order**

1 2 1 3 1 4 1 ...

Q0 = 1  
 Q1 = 2  
 Q2 = 1  
 Q3 = 3  
 Q4 = 1  
 Q5 = 4  
 Q6 = RST  
 Q7 = not connected  
 Q8 = not connected  
 Q9 = not connected

**Tape Order**

1 2 2 1 3 1 2 2 ...

Q0 = 1  
 Q1 = 2  
 Q2 = 2  
 Q3 = 1  
 Q4 = 3  
 Q5 = RST  
 Q6 = not connected  
 Q7 = not connected  
 Q8 = not connected  
 Q9 = not connected

The operational stages of the Speech Control Board are basically indicated by counter CD 4017 II. At its set input (which is also the set input for the whole operation of the Speech Control Board) lies a delay which prevents it from receiving more than one impulse within approx. three seconds. This is a precaution to eliminate false commands resulting from unclean signals.

The delay inputs are a pilot tone indicator (different to the one on the Music Control Board), which monitors the right channel of all speech / information tapes, and the Start Speech input which receives its signal from the Music Control Board. This signal is transformed to a single, short needle impulse (shown as *1x fast*) so that it does not overshadow the information comming from the pilot tone indicator.

Counter CD 4017 II sets four steps :

**Q0 = high :**

The speech / information sources are off, the TX signal is broadcast entirely from the music / entertainment source, the Volume Control input at the Audio Matrix is low, the pilot tone indicator's input is closed, the 17 seconds timer with CD 4024 is held in *reset* position and Flip/Flop 5 is enabled to trigger Flip/Flop 6, if required, to put Drive 4 prior to the other speech / information drives.

The next impulse will come from the Music Control Board to start a speech / information drive. This sets the counter CD 4017 II

**Q1 = high :**

The Volume Control input at the Audio Matrix becomes high, a speech / information drive will be started, the pilot tone indicator's input is now open, the 17 seconds counter is still held in *reset* position.

The next impulse to set CD 4017 II will be a pilot tone on the currently playing speech / information tape. This tone indicates that the speech / information input will end soon. This impulse sets the counter CD 4017 II to :

**Q2 = high :**

The Volume Control input at the Audio Matrix stays high but the music / entertainment source is restarted (with a signal sent to the Music Control Board), the speech / information drive continues to play , the 17 seconds counter is now started.

The next impulse to set CD 4017 II can be a pilot tone on the currently playing speech / information tape . This tone indicates that the speech / information input will now end . This impulse would set the counter CD 4017 II to :

**Q3 = high**

(Q3 is also named Point A) This stops the speech / information tape sets counter CD 4017 I and resets counter CD 4017 II into Q0 = high position .

If the pilot tone indicator should fail to receive another pilot tone within the 17 seconds talk over the next song's intro , the timer with CD 4024 will trigger . This will stop and rewind the speech / information tape , set counter CD 4017 I and reset counter CD 4017 II into Q0 = high position .

The Plug / Programme Disc outputs 1 & 2 & 3 ( Drive 1 - Drive 3 ) and the output of switch S2a ( Drive 4 ) determine the tape drive which will be put on the air. Counter CD 4017 II output Q1 or Q2 ( Point X ) put the currently chosen speech / information drive in play back mode . A further signal (Point A) comes from CD 4017 II output Q3 . A high signal at point X will put the chosen drive in play back mode . If Point X turns low and Point A stays low the drive will rewind the tape . If a high Point X becomes low but Point A switches to high the drive will be stopped .

The following controls (shown to the left in the block diagram) will give commands to the tape machines . They will convert

**Signal Point X**  
the signal for the drive choice  
and Signal point A into relay trigger:

the relevant trigger will be Start or Stop or Stop and Rewind Those controls consist of four Flip Flops, four Inverters, eight And Gates, two Delays and two Needle Impulse Senders . This description relates directly to the Speech Control Board operation with soft touch button controlled tape drives and the controls shown in the main Speech Control Board Diagram . The controls for the Special Cassette Drives are similar .

The diagram for the Speech Control Board shows the controls to run four different speech / information tape machines . This should be sufficient capacity to run even radio stations with a high speech / information output. Nevertheless further tape drives may be connected by expanding counter CD4017 I and additional control set ups following points A and X marked in the diagrams.

The diagram *Special Cassette Drive Connection* shows a tape set up with three drives which was specially designed for this Fully Automated Radio Disc Jockey System . It can be used instead of soft touch operated commercially available machines. This is a low cost alternative, with the additional advantage that the mechanical response delay is shorter than with usual soft touch operated tape decks . The mechanical drives have an electro magnet . If this magnet is in operation the drive will be in Play Back mode, otherwise it will be in Rewind mode . The Stop mode is the rewind mode with the motor switched off.

Tape Deck One has a further play back amplifier for a third track to play stereo speech / information inputs, if required. Stereo inputs have to be recorded on three track machines. Otherwise Tape Deck One needs to be switched to Mono play back mode.

The *Special Cassette Drive Connection Diagram* shows the play back amplifiers, the motor speed controls, cassette end indicators, auto mute facilities (to switch play back amplifiers off when not in use) and it also shows the relevant controls following the points A and X in the main Speech Control Board Diagram. Therefore the controls shown in the main diagram will not be used.

A special Plug / Programme Disc is shown in the *Remote Recording Control Disc Diagram*. This is a special connector to enable remotely controlled recordings with the same tape machine which is connected to the Fully Automated Radio Disc Jockey System. Obviously, this is only possible with tape machines which are fitted with a recording facility. The Remote Recording Control Disc will indicate when the machine is available for recording and if the recording is in progress it will divert eventual playback commands to other drives.

Switch S6 can delay the *high* command to the Audio Matrix. Such a delay would take into consideration that there is a short time difference between the Start Speech signal and the actual start of the tape due to mechanical inertia.

Tapes can be changed while transmission is in progress. This should be done while the relevant speech / information drive is in stop position. New tapes should be rewound to the beginning of a speech / information input.

The speech / information **Drive 4** has some special functions

Switch S2 determines if Drive 4 will be played in a programmed order designated by the Programme Disc /Plug and Counter CD 4017 I or if it may override the counter (order or timer mode).

Provided switch S2 is set to *Timer Play / Override*, a high impulse at the input of Flip / Flop 5 will give Drive 4 preference for the next speech / information programme input. This impulse can be a remotely sent signal (for example from an outside broadcast van) or a timer. This choice will be selected with switch S7. The timer, if selected, sets the Flip / Flop shortly before the full hour to broadcast e.g. the news or any other required speech / information item almost precisely on the hour, namely when the current music / entertainment input ends.

Please note, that in case Flip / Flop 5 is triggered while a speech / information tape is in operation, Drive 4 will not override this input immediately but it will be scheduled to insert the next speech / information input after the following music / entertainment input.

The output of Flip / Flop 5 is kept in *hold* position but will be admitted to trigger Flip / Flop 6 if Counter CD4017II's output Q0 is high.

A time signal (e.g. the Greenwich Bleeps or a station call sign) can be triggered off at the precise time when Flip / Flop 5 is set by the timer if its trigger is connected to the TS output. This signal will then override the current programme if mixed in a separate mixer with the TX output of the Audio Matrix. It is recommended to transmit it only on one of the two stereo channels.

Switch S4 sets the timer.

Further Special Functions of Drive 4 :

If switch S1 is set in *Special* position Drive 4 will rewind automatically after its programme input irrespectively of stop signals given by pilot tones .(This might shorten the 17 seconds talk over which is usually required for rewind commands).

If switch S5 is in on position counter CD 4017 I will be reset after every input from Drive 4 .

Instead of using a tape drive, one could use the Drive 4 function as the source input for a live-studio . In this case the *Drive 4 Start Relay* will trigger an *On Air Light* to notify the *Live Disc Jockey* .

The Basis Time Diagram shows a 1 Hz supply for all digital timers in the Fully Automated Radio Disc Jockey System and a 100 Hz supply to test the 3600 seconds timer, which is connected to Flip / Flop 5 on the Speech Control Board . To test this timer, switch S3 has to be set in test position . The timebase will be taken from the alternation of the AC-mains supply . For operation with no AC supply (e.g. of batteries in remote areas) The Basis Time has to be created by a oscillator, preferably a quartz oscillator.

The Fully Automated Radio Disc Jockey System can also be used to run a Fully Automated Television Station .

A Fully Automated Television Station works similarly to a Fully Automated Radio Disc Jockey System and mixes different programme inputs which were originally separated on different video tapes in different video recorders .

The Fully Automated Television Station will mix the programme inputs according to the outlined example :

While or after the entertainment source (eg. a film or music video) comes to its end, a link tape (eg.commercials,weatherforecast or a music video) switches on, meaning another programme source (speech / information) follows or is mixed over the outro of the entertainment source.

Seconds after the actual end of the entertainment input, its source will be stopped .

While or after the information input (link) comes to its end, the entertainment source switches on, meaning it follows or is mixed under the outro of the information . After the actual end of the speech / information input its tape drive will be stopped .

While or after the entertainment source comes to its end again, the process as described above will be repeated.

A combination of video recorders is required : they must have two audio tracks (mono), or three tracks for stereo operation and their Start, Stop and Rewind functions must have Soft Touch Controls.

Unless the entertainment programme inputs are exclusively Music inputs, the Fully Automated Television Station's *Music Control Board* must not be set to *Volume Level Indicator Mode* . Other inputs than music (e.g. Films, TV Shows, News ) do not have constant volume levels which would enable the Volume Level Indicators to work sufficiently .

For that reason the Fully Automated Television Station should only be run on pilot tone (or external) commands . Following this recommendation there is one of the audio tracks to be

used as the pilot tone channel, the other tracks are then free to carry the audio signals .

The audio outputs of the video recorders will be connected to the Fully Automated Radio Disc Jockey System, in the same way as signal sources / tape drives are connected for Fully Automated Radio Stations. The Video Outputs will be mixed in a separate video mixer which might be controlled by connection to the Music Volume Control output at the Speech Control Board or by any other possible means. This might also include additional contacts at the relays on the Speech Control Board which give Start and Stop signals to the drives . A selection of suitable Video Mixers is already commercially available .

### The Studio Controls

The Studio Controls are a little set up to support the recording of programme inputs which will be played on the Fully Automated Radio Disc Jockey System . The Studio Controls consist of Volume monitors and pilot tone generators .

Even though the Fully Automated Radio Disc Jockey System is very reliable it is recommendable to check music / entertainment Tapes before the first broadcast. The Volume Level Indicators work entirely on detection of a drop in volume; therefore it is possible that short gaps or slow parts within a song might trigger the 50 % Volume Level Indicators. A Recording Monitor was invented to avoid such mistakes during a radio programme .

This Recording Monitor has two Volume Level Indicators like the ones on the Music Control Board . One 50 % Volume Level Indicator and one for the 100 % level. They will be connected to the headphone output of the music recording machine in the studio . At their output are two lamps and a buzzer which can be switched off .

At the start of the recording of a song the Volume Level Indicators will be set . The 50 % lamp should switch off (and the buzzer should start during the outro) indicating the moment when the speech / information input would start if played by the Fully Automated Radio Disc Jockey System . The 100 % lamp switches off at the actual end of the song . If the lamps switch off at the required moment the recording will be suitable to be played on the Fully Automated Radio Disc Jockey System switched to Volume Level Indicator mode .

Music Tapes which were not recorded with the aide of a Recording Monitor should be played back through the music recording machine and checked by the Recording Monitor .

The Recording Monitor has to be set manually . For music recording machines with electro-mechanically switched Start , Stop and Record functions optional automatic facilities have been invented . An additional Set / Start switch will start the recorder and the Recording Monitor simultaneously and also take the 80 seconds timer at the Music Control Board into consideration . Three seconds after the end of the song the Recording Monitor will stop the recorder automatically, provided the song is suitable .

It is recommended that the music recorder should be preceded by an electronic limiter / compressor to increase the Volume Level Indicator's reliability .

The Studio Controls also have a 5 khz oscillator to record pilot tones. The pilot tone time will always be of the same duration, suitable for the decoders irrespective of the length of time the signal switch was pressed .

To simplify the speech / information recording there is an automatic facility to put a pilot tone on the tape as soon as the *Pause* button at the recorder is released. This puts the *Stop* command for the previous recording before the beginning of the current input . Only the *Start Music* command needs to be given manually .

Please note that the automatic facility has to be switched off, so that no pilot tone is recorded before the first and after the last recorded input on a tape.

The pilot tone timer for the automatic facility needs different RC (resistor / capacitor ) combinations for manual operated recording drives than for soft touch operated ones. This is due to longer mechanical inertia of electro-mechanically operated drives .

Opto isolators can be connected to the set switches (the *set* / *start* switch and the switch for the *start music* command) to attach a stop clock.

# Fully Automated Radio Disc Jockey System

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Other Start / Stop Functions	1 Sheet
5 Cassettes Loader	1 Sheet
Pilot Tone Gen. & Rec.Monitor (Block)	1 Sheet
Recording Monitor	1 Sheet
Pilot Tone Generator	1 Sheet
Special Cassette Drive Connection	10 Sheets
Switch Table	1 Sheet
Connector Pinout Specifications	1 Sheet
Diagram Index	1 Sheet

## Switches

### **Speech Control Board**

S1	Drive 4 Speech Special
S2	Drive 4 (speech) Order / Timer Play
S3	60 min Timer Test / 36 sec.
S4	60 min Timer Set
S5	Auto Counter I Reset after Drive 4 play
S6	Music Volume Reduction Delay
S7	Drive 4 (speech) Timer or External

### **Music Control Board**

S8	Left Channel Off
S8	both Channels Off if pilot tone mode
S9	Pilot Tone Control
S10	Pilot Tone / External Control (overrides S9)
S11	Pilot Tone Test / Off
S12	Special Music Play
S13	80 sec Timer Off (test)
S14	Motor Off Delay 3 sec / 4 sec
S15	Emergency Music Start Function Off

### **Music Play Back Counter**

S16	Count Number Set
S17	Count Number Set
S18	Music Play Back Counter Reset
S19	2 or 4 Drives
S20	Single Direction Mode Deck 2
S21	Single Direction Mode Deck 1
S22	Single Direction Mode Deck 4
S23	Single Direction Mode Deck 3

## MULTICORE SOCKET CONNECTIONS

	STUDIO	SPEECH / MUSIC	MPC
1	Pause	R-out	R-out
2	Pause	L-out	L-out
3	GND	GND	GND
4	Pause	1 Forward	Plus
5	Relay -		
5	Pause	1 Reverse	(SMS)
5	Relay +		
6	GND H.Ph.	1 Rewind	Start
7	Left H.Ph.	1 Stop	EMS
8	Right H.Ph.	2 Stop	Stop
9	Rec.Speech	-----	Set
10	Music Rec.	-----	-----
11	Music Rec.	-----	-----
12	L-in	-----	-----
13	R-in	2 Forward	-----
14	L-out	2 Reverse	-----
15	R-out	2 Rewind	-----

## FULLY AUTOMATED RADIO DISC JOCKEY SYSTEM - CLAIMS

1 Three main Operational Controls as a whole or parts thereof, namely:

The Audio Matrix

The Speech Control Board

The Music Control Board, including :  
 the Emergency Music Start Function  
 the Volume Level Indicators  
 the Pilot Tone Controlled Cassette Change Function  
 the Security Music Start Function

2 Six optional Operational Controls as a whole or parts thereof, namely

The Music Play Back Counter  
 The Other Start / Stop Functions  
 The Five Cassettes Loader  
 The Special Drive Connections  
 The Remote Recording Control Disc  
 The Studio Controls

3 A Fully Automated Radio Disc Jockey System which mixes music / entertainment programme inputs with different speech / information items .

The entertainment programme input (music) is separated from the information input .

The Fully Automated Radio Disc Jockey System will mix the two programme parts :

While or after the music / entertainment input starts to fade out, a speech tape switches on , meaning another programme source (speech / information) follows or is mixed over the outro of the music .

After the actual end of the music / entertainment input the music / entertainment source will be stopped .

While or after the speech / information input comes to its end the music / entertainment source switches on , meaning it follows or is mixed under the outro of the speech / information .

After the actual end of the speech / information input its tape drive will be stopped .

While or after the music / entertainment source starts to fade out again, the process as described above will be repeated.

4 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 which consists of the Operational Controls which were listed in Claim 1 .

5 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or Claim 4 which also consists of one or more of the Operational Controls which were listed in Claim 2 .

6 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid

down in this document wherein the Audio Matrix has a Volume Control input which is controlled by the Speech Control Board.

7 A Fully Automated Radio Disc Jockey System as claimed in Claim 6 wherein if the Volume Control input at the Audio Matrix is low the speech / information input will be closed, and the music / entertainment input will be fully opened. If the Volume Control input is high the speech / information input will be fully opened and the music / entertainment input will be reduced in volume.

8 A Fully Automated Radio Disc Jockey System as claimed in Claim 6 or Claim 7 wherein the level of reduction is variable and can be preset.

9 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Emergency Music Start Function is a back up control to reset the whole Fully Automated Radio Disc Jockey System, should a fault (blank air) occur.

10 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Emergency Music Start Function, if triggered, will give a Start signal to the Music Start input of the Music Control Board and a Signal will also be sent to reset / set the Music Play Back Counter.

11 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Emergency Music Start Function will stop and rewind a relevant speech / information tape if it is faulty / the reason for blank air.

12 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Control Board has three different possibilities (modes) to monitor the music / entertainment input.

13 A Fully Automated Radio Disc Jockey System as claimed in Claim 9 wherein the relevant monitors are either, Volume Level Indicators or an external controller or a pilot tone decoder.

14 A Fully Automated Radio Disc Jockey System as claimed in Claim 12 or Claim 13 wherein the monitor facility will signal twice  
Once to indicate that the song (music / entertainment input) is fading out (50 % Monitor).  
Once to indicate the actual end of a music / entertainment input (100 % Monitor).

15 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the 50 % Volume monitor gives a Start Speech Signal to the Speech Control

Board, meaning it starts a speech / information tape, as well as giving a set / count signal to the Music Play Back Counter.

16 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the 100 % Volume monitor leads the right channel of the music / entertainment source to the pilot tone decoder and starts a timer facility which stops the source after a pre set interval (*stop break*).

17 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the 100 % Volume monitor switches the link off to the Audio Matrix from the right channel of the music / entertainment source

and, if required by a relevant switch setting,  
switches the link off to the Audio Matrix from the left channel of the music / entertainment source  
or switches the link off to the Audio Matrix from the whole music / entertainment source if the Music Control Board is in pilot tone operation mode (two track recorded source).

18 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Pilot Tone Controlled Cassette Change Function might override the switch off command.

19 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Pilot Tone Controlled Cassette Change Function will stop the source as soon as the Pilot Tone Controlled Cassette Change Function receives two Pilot Tones from the right channel of the source unless a Start Music signal was received from the Speech Control Board before the second tone .

20 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein a Music Start signal will

give a start signal to the Music Play Back Counter  
and direct a trigger to the Security Music Start Function with the intention to switch a Start / Stop Relay which controls one button only controlled music / entertainment play back sources .

and set (start) the Volume Level Indicators

it will also start a timer which, for a preset duration, overrides the level indicators and prevents it from giving the start speech signal and from stopping the music / entertainment source .

furthermore this signal will indirectly reset all counters situated on the Music Control Board .

21 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Control Board has a 80 seconds timer which will primarily protect the 50 % Volume Level Indicator from giving false signals during a song's intro .

22 A Fully Automated Radio Disc Jockey System as claimed in Claim 18 wherein the 80 seconds delay / timer can be switched off .

23 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein it considers an uninterrupted playback of a prepackaged programme which does not require further speech / information inputs.

24 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the playback of a prepackaged programme can override the 50 % level indicator and prevent it from giving the start speech signal .

25 A Fully Automated Radio Disc Jockey System as claimed in Claim 23 or Claim 24 wherein automated programming resumes after the prepackaged programme is finished .

26 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the music / entertainment input can be played from various sources provided these sources have electro-mechanically switched drives . The music / entertainment input is not limited to tape machines .

27 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein music / entertainment sources connected to the Fully Automated Radio Disc Jockey System can either be controlled by a relay on the Music Control Board , or by the Start / Stop Control as shown in the Other Start / Stop Functions Diagram , or by the Music Play Back Counter .

28 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein a relay on the Music Control Board gives both, the start and the stop commands for music / entertainment sources .

29 A Fully Automated Radio Disc Jockey System as claimed in Claim 28 wherein the relay's triggers are safeguarded by the use of the Security Music Start function .

30 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Other Start / Stop Functions set up have two relays to send a separate Start and Stop impulse to the music / entertainment source.

31 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter can be used with two or four single or reverse direction drives.

32 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter, if expanded, can be used with any amount single or reverse direction drives, as long as their quantity is higher than two

33 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the music / entertainment tape machines used in conjunction with the Music Play Back Counter can be either Reel To Reel or Cassette drives .

34 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter is to play a certain number of songs on each side of a tape .

35 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the setting of the Music Play Back Counter can be programmed for three different steps between two and 99 songs.

36 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the setting of the Music Play Back Counter can be programmed for different steps of any amount of songs, provided the capacity of the relevant counter(s) will be expanded .

37 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter will give a command to rewind the tape to the beginning after playing the set amount of songs on the reverse side .

38 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter will give a command to rewind the tape to the beginning after playing the set amount of songs on Side 1 provided the drive is in Single Direction Mode .

39 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter counts its set /song count impulse even if the tape drive does not stop between the songs / inputs .

40 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein it is possible to play almost all commercially recorded tapes on the music / entertainment cassette recorders, provided the Fully Automated Radio Disc Jockey System is set to the right mode.

41 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein tapes can be changed while transmission is in progress.

42 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter is equipped with an emergency start facility as a back up control, should a fault occur.

43 A Fully Automated Radio Disc Jockey System as claimed in Claim 42 wherein the emergency start facility can be triggered by the Emergency Music Start Function.

44 A Fully Automated Radio Disc Jockey System as claimed in Claim 42 or Claim 43 wherein the emergency start facility will monitor if a music / entertainment drive is in operation. An incoming Emergency Music Start signal will start the next music / entertainment machine and rewind side 1 of the tape which caused the fault, if the drive was in operation.

If the drive is not in operation the Music Play Back Counter will just start the next lined up song.

45 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the running order of the speech / information tape machines can be preprogrammed.

46 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the *set* input of the Speech Control Board has a precaution to eliminate false commands resulting from unclean signals.

47 A Fully Automated Radio Disc Jockey System as claimed in Claim 46 wherein the precaution is a delay.

48 A Fully Automated Radio Disc Jockey System as claimed in Claim 47 wherein the delay prevents the *set* input of receiving more than one impulse within three seconds.

49 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Speech Control Board's *set inputs* are a pilot tone indicator, which monitors the right channel of all speech / information tapes, and the *Start Speech* input which receives its signal from the Music Control Board.

50 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Start Speech signal from the Music Control Board does not overshadow the information coming from the pilot tone indicator.

51 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Start Speech signal from the Music Control Board is transformed to a single, short needle impulse.

52 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Speech Control Board includes a timer.

53 A Fully Automated Radio Disc Jockey System as claimed in Claim 52 wherein the timer's function is to give a rewind signal to the currently playing speech / information drive, once its preset time is run up.

54 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Speech Control Board sets four steps.

55 A Fully Automated Radio Disc Jockey System as claimed in Claim 54 wherein Counter CD 4017 II sets these four steps.

56 A Fully Automated Radio Disc Jockey System as claimed in Claim 54 or Claim 55 wherein step one makes sure that the speech / information sources are off, the TX signal is entirely broadcast from the music / entertainment source, the Volume Control input at the Audio Matrix is low, the pilot tone indicator's input is closed, the timer as mentioned in Claim 52 or Claim 53 is held in *reset* position and a trigger to put Drive 4 prior to the other speech / information drives will not any longer be kept on *hold*.

57 A Fully Automated Radio Disc Jockey System as claimed in Claim 54 or Claim 55 wherein step two makes sure that the Volume Control input at the Audio Matrix becomes high, a speech / information drive will be started, the pilot tone indicator's input is open, the timer as mentioned in Claim 52 or Claim 53 is held in *reset* position.

58 A Fully Automated Radio Disc Jockey System as claimed in Claim 54 or Claim 55 wherein step three makes sure that the Volume Control input at the Audio Matrix stays high but the music / entertainment source is restarted (with a signal sent to the Music Control Board), the speech / information drive continues to play, the timer as mentioned in Claim 52 or Claim 53 is now started.

59 A Fully Automated Radio Disc Jockey System as claimed in Claim 54 or Claim 55 wherein step four can be triggered by the pilot tone indicator or by the timer as mentioned in Claim 52 or Claim 53.

60 A Fully Automated Radio Disc Jockey System as claimed in Claim 54 or Claim 55 or Claim 59 wherein

if triggered by the pilot tone indicator step four will stop the speech / information tape , set the running order for the next speech / information input and reset the Speech Control Board (Counter CD 4017 II as indicated in Claim 55) back to step one.

if triggered by the timer as mentioned in Claim 52 or Claim 53 or Claim 59 step four will stop and rewind the speech / information tape set the running order for the next speech / information input and reset the Speech Control Board (Counter CD 4017 II as indicated in Claim 55) back to step one .

61 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Programme Disc outputs 1 & 2 & 3 ( Drive 1 - Drive 3 ) and the output of the switch , which selects order or timer mode for Drive 4, determine the speech / information tape drive which will be put on the air.

62 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein if Point X (Play Back On) turns low and Point A (Rewind Off) stays low the drive will rewind the tape .

63 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein if a high Point X (Play Back On) becomes low but Point A (Rewind Off) switches to high the drive will be stopped .

64 A Fully Automated Radio Disc Jockey System as claimed in Claim 62 or in Claim 63 wherein Counter CD 4017 II output Q1 or Q2 ( Point X (Play Back On) ) puts the currently chosen speech / information drive in play back mode.

65 A Fully Automated Radio Disc Jockey System as claimed in Claim 62 or in Claim 63 wherein a signal (Point A (Rewind Off)) comes from CD 4017 II output Q3 .

66 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein controls are provided which will give commands to the tape machines .

67 A Fully Automated Radio Disc Jockey System as claimed in Claim 66 wherein these controls convert signal Point X (Play Back On) , the signal for the drive choice and signal Point A (Rewind Off) into relay trigger according to Claim 62 or Claim 64 or Claim 65 .

68 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein four speech / information tape drives are connected .

69 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein any amount of speech / information tape drives may be connected if the capacity of counter CD4017 I is increased and additional control set ups according to Claim 66 or Claim 67 are installed .

70 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the *Special Cassette Drive Connection* is a speech / information tape drive set up which were specially designed for this Fully Automated Radio Disc Jockey System .

71 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the *Special Cassette Drive Connection* can be used instead of soft touch operated commercially available machines .

72 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein Tape Deck One of the *Special Cassette Drive Connection* has a further play back amplifier for a third track to play stereo speech / information inputs, if required .

73 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the *Remote Recording Control Disc* is a special connector to enable remotely controlled recordings with the same tape machine which is connected to the Fully Automated Radio Disc Jockey System .

74 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the *Remote Recording Control Disc* will indicate when the relevant drive is available for recording .

75 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the *Remote Recording Control Disc* will divert eventual playback commands to other drives, if recording is in progress .

76 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the *high* command directed to the Volume Control Input at the Audio Matrix can be delayed .

77 A Fully Automated Radio Disc Jockey System as claimed in Claim 76 wherein the Delay can be switched off .

78 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein a Switch determines if a special speech / information Drive will be played in a programmed order or if it may override the order .

79 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Override Function as mentioned in Claim 78 can be a remotely sent external signal or originate from a timer .

80 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Special Drive Override Function, as mentioned in Claim 78 or Claim 79, will not override the programme output of the Fully Automated Radio Disc Jockey System immediately but will be scheduled to insert the next speech / information input .

81 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the TS output of the Speech Control Board can trigger a time signal or another external appliance .

82 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein a speech / information Drive if switched to *Special* position will rewind automatically after its programme input .

83 A Fully Automated Radio Disc Jockey System as claimed in Claim 82 wherein the *Special* position can be switched off .

84 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the speech / information running order can be reset after every input from a special speech / information Drive .

85 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Reset Funcion as mentioned in Claim 85 can be switched off .

86 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the speech / information Drive 4 function can be used as the source input for a live-studio .

87 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the 100% Volume Level Indicators triggers an opto isolator for external signaling .

88 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein this *Fully Automated Radio Disc Jockey System* can also be used to run a Fully Automated Television Station.

89 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls are to support the recording of programme inputs which will be played on the Fully Automated Radio Disc Jockey System.

90 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls consist of Volume Monitors and Pilot Tone Generators.

91 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls have a pilot tone oscillator to record pilot tones which will always be of the same duration, irrespective of the length of time the signal switch was pressed.

92 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls have an automatic facility to put a pilot tone on the tape as soon as the *Pause* button at the recorder is released.

93 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document wherein opto isolators are connected to the set switches of the Studio Controls to trigger a stop clock.

94 A Fully Automated Television Station wherein a Fully Automated Television Station works similarly to a Fully Automated Radio Disc Jockey System and mixes different programme inputs which were originally separated on different video tapes in different video recorders.

95 A Fully Automated Television Station as claimed in Claim 94 wherein the Fully Automated Television Station will mix the programme inputs according to the outlined example :

While or after the entertainment source comes to its end, a link tape switches on, meaning another programme source (information) follows or is mixed over the outro of the entertainment source.

After the actual end of the entertainment input, its source will be stopped.

While or after the information input (link) comes to its end, the entertainment source switches on, meaning it follows or is mixed under the outro of the information. After the actual end of the information input its tape drive will be stopped.

29

While or after the entertainment source comes to its end again, the process as described above will be repeated.

96 A Fully Automated Television Station as claimed in Claim 94 or Claim 95 wherein a Fully Automated Television Station has the same features as a Fully Automated Radio Disc Jockey System as claimed in Claim 3 or in any of the following Claims thereafter as laid down in this document .

AMENDMENTS TO THE CLAIMS HAVE BEEN FILED AS FOLLOWS

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recorded with subaudible tones) for broadcast purposes .

1 A Fully Automated Radio or Television Programme Selection System which is able to mix fade and crossfade (fading one signal over another one) different programme items such as music / entertainment, speech, information, commercials and news , which are selected from two or more playback facilities / programme sources (eg.tape recorders or record discs).

This System will provide an uninterrupted programme flow as it is commonly known from public broadcasting services without immediate need for a human operator in the studio (eg a Disc Jockey ).

Selection of input items, energising or deenergising of sources, mixing, fading and crossfading of signals will be initiated by the system according to the immediate requirements of the programme in accordance with a preset programme policy rather than a single indication, soley determined by one programme source .

2 A Fully Automated Radio or Television Programme Selection System wherein all available programme sources are subdivided into two programme branches namely a main (music / entertainment) branch and a link (speech / information) branch.

This is to enable the Fully Automated Radio or Television Programme Selection System to use almost all commercially recorded music tapes on the main (music / entertainment) branch , provided a suitable operation mode is selected .

Therefore main (music / entertainment) programme inputs do not necessarily have to be specially recorded or prepared (eg.timed or

3 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein this *Fully Automated Radio or Television Programme Selection System* can also be used to run a Fully Automated Radio Disc Jockey System . It will mix different programme inputs which were originally separated on different audio records or tapes in different playback recorders .

4 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein this *Fully Automated Radio or Television Programme Selection System* can also be used to run a Fully Automated Television Station . It will mix different programme inputs which were originally separated on different video tapes in different video recorders .

5 A Fully Automated Radio Disc Jockey System as claimed in Claim 3 which will establish the programme according to the following example:

While (or after) the main (music / entertainment) input starts to fade out, a speech tape switches on, meaning another programme source (speech / information) is mixed over (or follows) the outro of the music .

After the actual end of the main (music / entertainment) input the main source will be stopped .

While (or after) the link (speech / information) input comes to its end, the main (music / entertainment)

source switches on, meaning it is mixed under (or follows) the outro of the link (speech / information).

After the actual end of the link (speech / information) input its tape drive will be stopped.

While (or after) the main (music / entertainment) source starts to fade out again, the process as described above will be repeated.

**6 A Fully Automated Television Station as claimed in Claim 4 wherein the Fully Automated Television Station will mix the programme inputs according to the outlined example:**

While or after the entertainment source comes to its end,a link tape switches on ,meaning another programme source (information) follows or is mixed over the outro of the entertainment source.

After the actual end of the entertainment input, its source will be stopped .

While or after the information input (link) comes to its end,the entertainment source switches on, meaning it follows or is mixed under the outro of the information .

After the actual end of the information input its tape drive will be stopped .

While or after the entertainment source comes to its end again, the process as described above will be repeated.

**7 A Fully Automated Television Station as claimed in Claim 4 or Claim 6 wherein a Fully Automated Television Station has the same features as a Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following**

Claims thereafter as laid down in this document .

A Fully Automated Radio Disc Jockey System as claimed in Claim 3 or Claim 5 wherein a Fully Automated Radio Disc Jockey System has the same features as a Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document .

**8 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein tapes can be changed while transmision is in progress**

**9 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Emergency Music Start Function is a back up control to reset the whole Fully Automated Radio or Television Programme Selection System, should a fault (*dead air*)occur .**

**10 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Emergency Music Start Function, if triggered, will give a *Start* signal to the Music Start input of the Music Control Board and a Signal will also be sent to reset / set the Music Play Back Counter.**

11 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Emergency Music Start Function will stop and rewind a relevant link (speech / information) tape if it is faulty / the reason for *dead air*.

12 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Music Control Board has three different possibilities (modes) to monitor the main (music / entertainment) input.

13 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 12 wherein the relevant monitors are either Volume Level Indicators or an external controller or a pilot tone decoder.

14 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 12 or Claim 13 wherein the monitor facility will signal twice

Once to indicate that the song (main (music / entertainment) input) is fading out (50 % Monitor).

Once to indicate the actual end of a main (music / entertainment) input (100 % Monitor).

15 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the 50 % Volume monitor gives a Start Speech Signal to the Speech Control Board, meaning it

starts a link (speech / information) tape, as well as giving a set / count signal to the Music Play Back Counter.

16 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the 100 % Volume monitor leads the right channel of the main (music / entertainment) source to the pilot tone decoder and starts a timerfacility which stops the source after a pre set interval (*stop break*).

17 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the 100 % Volume monitor switches the link off to the Audio Matrix from the right channel of the main (music / entertainment) source

and, if required by a relevant switch setting,

switches the link off to the Audio Matrix from the left channel of the main (music / entertainment) source

or switches the link off to the Audio Matrix from the whole main (music / entertainment) source if the Music Control Board is in pilot tone operation mode (two track recorded source).

18 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Pilot Tone Controlled Cassette Change Function* might override the switch off command.

19 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Pilot Tone Controlled Cassette Change Function* will stop the source as soon as the Pilot Tone Controlled Cassette Change Function receives two Pilot Tones from the right channel of the source unless a Start Music signal was received from the Speech Control Board before the second tone

20 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein a *Music Start* signal will

give a start signal to the Music Play Back Counter

and direct a trigger to the Security Music Start Function with the intention to switch a Start / Stop Relay which controls one button only controlled main (music / entertainment) play back sources .

and set (start) the Volume Level Indicators

it will also start a timer which, for a preset duration, overrides the level indicators and prevents it from giving the *start speech* signal and from stopping the main (music / entertainment) source .

furthermore this signal will indirectly reset all counters situated on the Music Control Board .

21 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims

thereafter as laid down in this document wherein the Music Control Board has a 80 seconds timer which will primarily protect the 50 % Volume Level Indicator from giving false signals during a song's intro .

22 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 21 wherein the 80 seconds delay / timer can be switched off .

23 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein it considers an uninterrupted playback of a prepackaged programme which does not require further link (speech / information) inputs.

24 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the playback of a prepackaged programme can override the 50 % level indicator and prevent it from giving the *start speech signal*.

25 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 23 or Claim 24 wherein automated programming resumes after the prepackaged programme is finished .

26 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the main (music / entertainment) input can be played from various sources provided these sources have electro-mechanical switched drives . The main (music / entertainment) input is not limited to tape machines .

27 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein main (music / entertainment) sources connected to the Fully Automated Radio or Television Programme Selection System can either be controlled by a relay on the Music Control Board , or by the Start / Stop Control as shown in the *Other Start / Stop Functions Diagram* , or by the Music Play Back Counter .

28 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein a relay on the Music Control Board gives both, the start and the stop commands for main (music / entertainment) sources.

29 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 28 wherein the relay's triggers are safeguarded by the use of the *Security Music Start* function .

30 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim

2 or in any of the following Claims thereafter as laid down in this document wherein the *Other Start / Stop Functions* set up have two relays to send a seperate Start and Stop impulse to the main (music / entertainment) source.

31 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter can be used with two or four single or reverse direction drives.

32 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter , if expanded , can be used with any amount single or reverse direction drives, as long as their quantity is higher than two .

33 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the main (music / entertainment) tape machines used in conjunction with the Music Play Back Counter can be either Reel To Reel or Cassette drives .

34 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter is to play a certain number of songs on each side of a tape .

35 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the setting of the Music Play Back Counter can be programmed for three different steps between two and 99 songs.

36 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the setting of the Music Play Back Counter can be programmed for different steps of any amount of songs, provided the capacity of the relevant counter(s) will be expanded.

37 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter will give a command to rewind the tape to the beginning after playing the set amount of songs on the reverse side.

38 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter will give a command to rewind the tape to the beginning after playing the set amount of songs on Side 1 provided the drive is in *Single Direction Mode*.

39 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims

thereafter as laid down in this document wherein the Music Play Back Counter counts its *set /song count* impulse even if the tape drive does not stop between the songs / inputs.

40 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Audio Matrix has a *Volume Control* input which is controlled by the Speech Control Board.

41 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 40 wherein if the Volume Control input at the Audio Matrix is low the link (speech / information) input will be closed, and the main (music / entertainment) input will be fully opened. If the Volume Control input is high the link (speech / information) input will be fully opened and the main (music / entertainment) input will be reduced in volume. The level of reduction is variable and can be preset.

42 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Music Play Back Counter is equipped with an emergency start facility as a back up control, should a fault occur.

43 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 42 wherein the emergency start facility can be triggered by the Emergency Music Start Function .

44 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 42 or Claim 43 wherein the emergency start facility will monitor if a main (music / entertainment) drive is in operation . An incomming Emergency Music Start signal will start the next main (music / entertainment) machine and rewind side 1 of the tape which caused the fault,if the drive was in operation .

If the drive is not in operation the Music Play Back Counter will just start the next lined up song .

45 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the running order of the link (speech / information) tape machines can be preprogrammed .

46 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *set*/input of the Speech Control Board has a precaution to eliminate false commands resulting from unclean signals.

47 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 46 wherein the precaution is a delay .

48 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 47 wherein the delay prevents the *set* input of receiving more than one impulse within three seconds .

49 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Speech Control Board's *set inputs* are a pilot tone Indicator, which monitores the right channel of all link (speech / information) tapes, and the *Start Speech* input which receives its signal from the Music Control Board.

50 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Start Speech* signal from the Music Control Board does not overshadow the information coming from the pilot tone indicator .

51 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Start Speech* signal from the Music Control Board is transformed to a single, short needle impulse .

52 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Speech Control Board includes a timer.

53 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 52 wherein the timer's function is to give a rewind signal to the currently playing link (speech / information) drive,once its preset time is run up.

54 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Speech Control Board sets four steps.

55 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 54 wherein Counter I10 sets these four steps.

56 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 54 or Claim 55 wherein step one makes sure that

the link (speech / information) sources are off , the TX signal is entirely broadcast from the main (music / entertainment) source , the Volume Control input at the Audio Matrix is low , the pilot tone indicator's input is closed , the timer as mentioned in Claim 52 or Claim 53 is held in *reset* position and a trigger to put Drive 4 prior to the other link (speech / information) drives will not any longer be kept on *hold*.

57 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 54 or Claim 55 wherein step two makes sure that

the Volume Control input at the Audio Matrix becomes high , a link (speech / information) drive will be started , the pilot tone indicator's input is open , the timer as mentioned in Claim 52 or Claim 53 is held in *reset* position.

58 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 54 or

Claim 55 wherein step three makes sure that

the Volume Control input at the Audio Matrix stays high but the main (music / entertainment) source is restarted (with a signal sent to the Music Control Board ), the link (speech / information) drive continues to play , the timer as mentioned in Claim 52 or Claim 53 is now started.

59 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 54 or Claim 55 wherein step four can be triggered by the pilot tone indicator or by the timer as mentioned in Claim 52 or Claim 53.

60 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 54 or Claim 55 or Claim 59 wherein

if triggered by the pilot tone indicator step four will stop the link (speech / information) tape , set the running order for the next link (speech / information) input and reset the Speech Control Board (Counter I10 as indicated in Claim 55) back to step one.

if triggered by the timer as mentioned in Claim 52 or Claim 53 or Claim 59 step four will stop and rewind the link (speech / information) tape set the running order for the next link (speech / information) input and reset the Speech Control Board (Counter I10 as indicated in Claim 55) back to step one .

61 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Programme Disc outputs 1 & 2 & 3 ( Drive 1 - Drive 3 ) and the output of the switch , which selects *order* or *timer* mode for Drive 4, determine the link (speech / information) tape drive which will be put on the air.

62 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein if Point Z (Play Back On) turns low and Point A (Rewind Off) stays low the drive will rewind the tape .

63 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein if a high Point Z (Play Back On) becomes low but Point A (Rewind Off) switches to high the drive will be stopped .

64 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 62 or in Claim 63 wherein Counter I10 output Q1 or Q2 ( Point Z (Play Back On) ) puts the currently chosen link (speech / information) drive in *playback* mode.

65 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 62 or in Claim 63 wherein a signal (Point A (Rewind Off)) comes from I10 output Q3 .

66 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein controls are provided which will give commands to the tape machines .

67 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 66 wherein these controls convert signal Point Z (Play Back On) ,the signal for the drive choice and signal Point A (Rewind Off) into relay trigger according to Claim 62 or Claim 64 or Claim 65 .

68 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein four link (speech / information) tape drives are connected.

69 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein any amount of link (speech / information) tape drives may be connected if the capacity of counter IC4 is increased and additional control set ups according to Claim 66 or Claim 67 are installed .

39

70 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Special Cassette Drive Connection* is a link (speech / information) tape drive set up which were specially designed for this Fully Automated Radio or Television Programme Selection System.

71 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Special Cassette Drive Connection* can be used instead of soft touch operated commercially available machines.

72 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein Tape Deck One of the *Special Cassette Drive Connection* has a further play back amplifier for a third track to play stereo link (speech / information) inputs, if required.

73 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Remote Recording Control Disc* is a special connector to enable remotely controlled recordings with the same tape machine which is connected to the Fully Automated Radio or Television Programme Selection System.

74 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Remote Recording Control Disc* will indicate when the relevant drive is available for recording.

75 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *Remote Recording Control Disc* will divert eventual playback commands to other drives, if recording is in progress.

76 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the *high* command directed to the Volume Control Input at the Audio Matrix can be delayed.

77 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 76 wherein the Delay can be switched off.

78 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein a Switch determines if a special link (speech / information) Drive will be played in a programmed order or if it may override the order.

79 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Override Function as mentioned in Claim 78 can be a remotely sent external signal or originate from a timer.

80 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Special Drive Override Function, as mentioned in Claim 78 or Claim 79, will not override the programme output of the Fully Automated Radio or Television Programme Selection System immediately but will be scheduled to insert the next link (speech / information) input.

81 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the TS output of the Speech Control Board can trigger a time signal or another external appliance.

82 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein a link (speech / information) Drive if switched to *Special* position will rewind automatically after its programme input.

83 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 82

wherein the *Special* position can be switched off.

84 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the link (speech / information) running order can be reset after every input from a special link (speech / information) Drive.

85 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Reset Function as mentioned in Claim 84 can be switched off.

86 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the link (speech / information) Drive 4 function can be used as the source input for a live-studio.

87 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the 100% Volume Level Indicators triggers an opto isolator for external signaling.

88 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document which consists of one or more of the following main Operational Controls or parts thereof :

*The Audio Matrix*

*The Speech Control Board*

*The Music Control Board, including :  
the Emergency Music Start Function  
the Volume Level Indicators  
the Pilot Tone Controlled Cassette Change Function  
the Security Music Start Function*

and/or a Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document which consists of one or more of the following optional Operational Controls or parts thereof,namely

*The Music Play Back Counter  
The Other Start / Stop Functions  
The Five Cassettes Loader  
The Special Drive Connections  
The Remote Recording Control Disc  
The Studio Controls*

89 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls are to support the recording of programme inputs which will be played on the Fully Automated Radio or Television Programme Selection System .

90 A Fully Automated Radio or Television Programme Selection

System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls consist of Volume Monitors and Pilot Tone Generators .

91 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls have a pilot tone oscillator to record pilot tones which will always be of the same duration,irrespective of the length of time the signal switch was pressed

92 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein the Studio Controls have an automatic facility to put a pilot tone on the tape as soon as the *Pause* button at the recorder is released.

93 A Fully Automated Radio or Television Programme Selection System as claimed in Claim 1 or Claim 2 or in any of the following Claims thereafter as laid down in this document wherein opto isolators are connected to the set switches of the Studio Controls to trigger a stop clock.

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